RAILROAD GAZETTE

SATURDAY, NOVEMBER 2, 1872.

Boiler for Switching Engine.

The engraving herewith and the following description of this boiler are copied from *Engineering*. It was designed by Mr. F. W. Webb, the Locomotive Superintendent of the London & Northwestern Railway:

"Referring to the longitudinal section and the end elevation and transverse sections on the present page, it will be seen that the boiler is of the plain cylindrical class, with an internal cylindrical fire-box, this type of boiler, which was introduced on the London & Northwestern Railway by Mr. Ramsbottom, being a very convenient one for six-coupled tank engines employed for shunting purposes, as it enables the weight to be very well distributed. The boiler is made of steel throughout, the plates being ⅞in. thick, with the exception of the tube-plates, which are ⅝in. thick. The fire-box is strengthened by an angle-iron ring riveted to it at the middle of its length, as shown, but is otherwise without stays. The principal dimensions of the boiler are given in our engravings, and they need not therefore be repeated here.

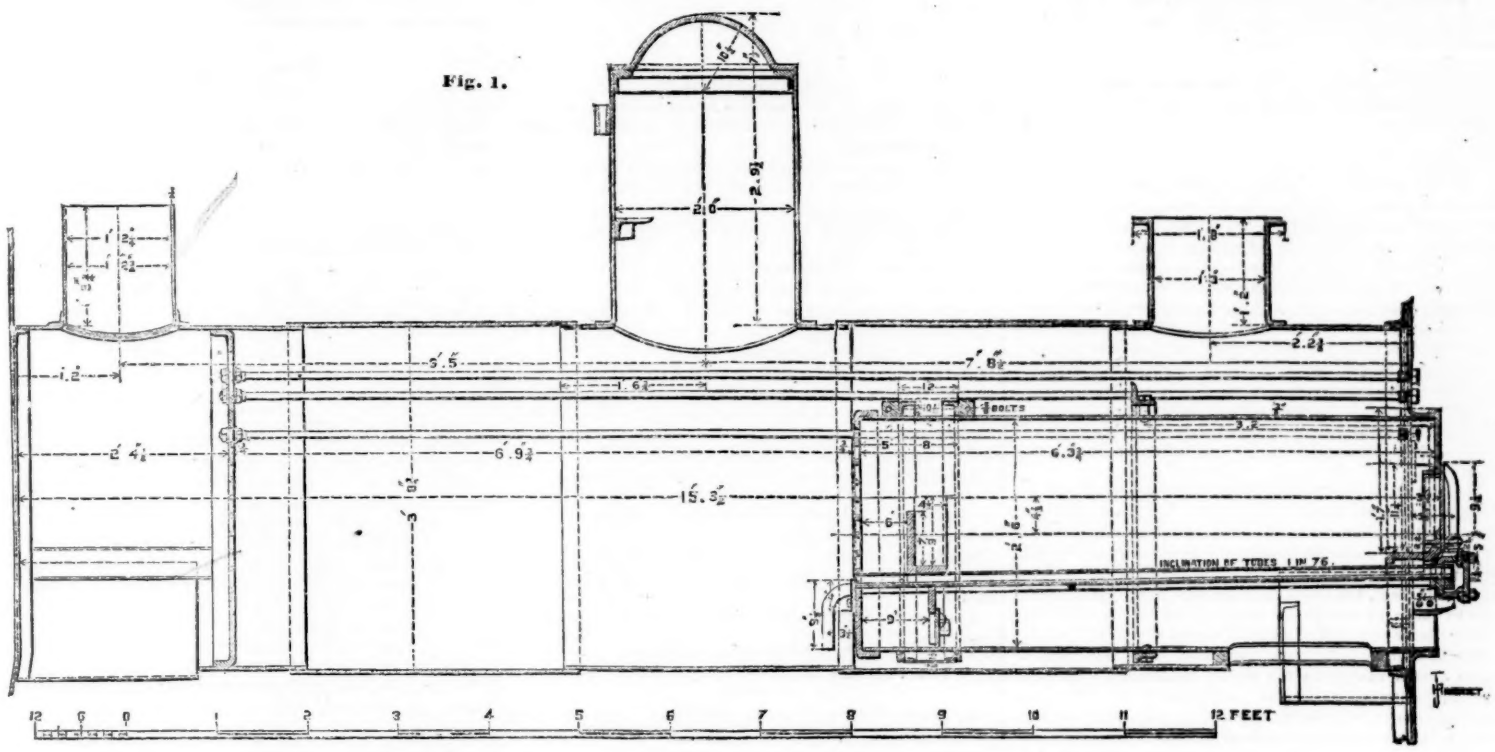
"As many of our readers are no doubt aware, water-tube grates have long been employed in America for engines burning anthracite coal; but the construction of the boiler of which we are now speaking did not permit of the application of the ordinary American arrangement, and hence Mr. Webb was led to design the plans we illustrate. Referring again to the engravings, it will be seen that the grate consists of thirteen wrought-iron 1¾in. tubes, these tubes being zigzagged, as shown in figs. 2 and 3, and leading from the firebox tube-plate to a gun-metal box or casing (see fig. 4) which extends across the front of the boiler below the fire-door. The tubes rise towards this box with an inclination of 1 in 76, and two of them are fitted, at the end next the smokebox, with bent copper circulating tubes, which dip downwards so as to draw the water from the bottom of the boiler, as shown in the longitudinal section.

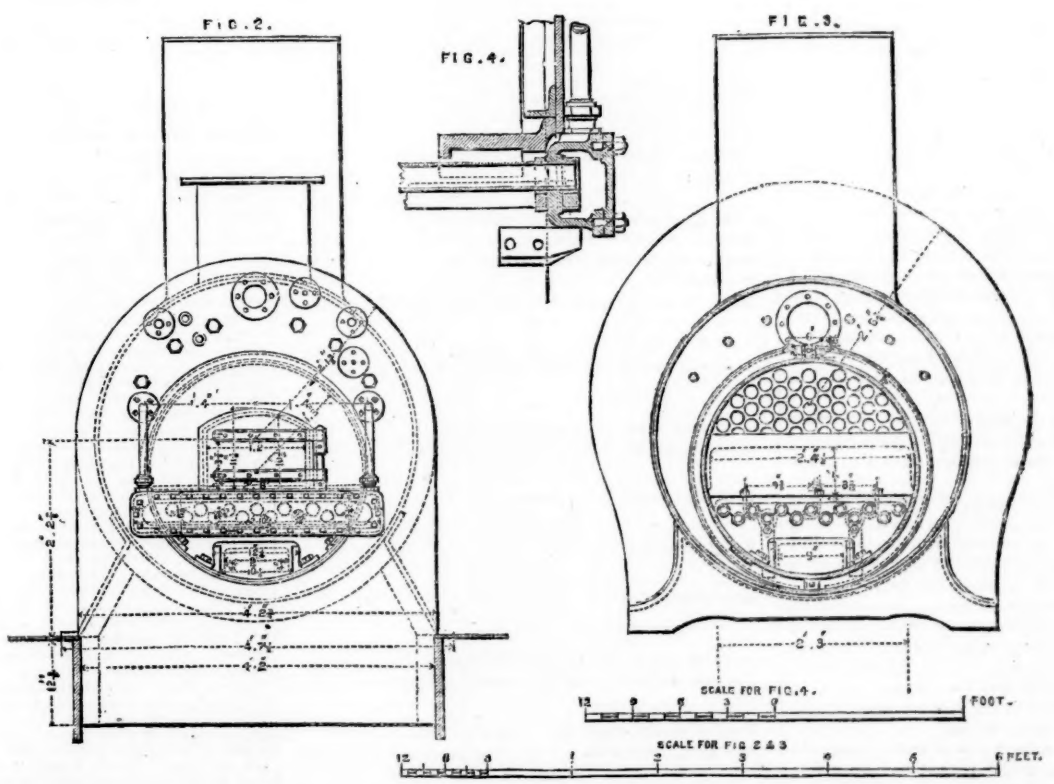
"The gun-metal box which extends across and below the fire-door, as shown in the end elevation on this page, is furnished at its ends with two copper tubes, which lead upwards, and are connected to the boiler, as shown. The opportunity is thus afforded for a complete circulation upwards through the tubes composing the fire-grate, and in practice this circulation is found to be quite sufficient to protect the tubes thoroughly. The gun-metal box, too, being suspended by the copper tubes already mentioned, can yield as the fire-grate tubes expand or contract, and thus the latter are kept free from strains due to this cause. A cover at the front of the box enables the tubes to be got at readily for inspection.

"Besides fitting the boiler with the water grate, Mr. Webb has added an arrangement for increasing the circulation from the lower part of the boiler, and protecting the fire-box at the bridge, where it is exposed to the most intense heat. This arrangement consists simply of two light angle-iron rings placed around the fire-box near the bridge, and 8 in. apart, these rings having attached to them a light covering plate, as shown in the transverse section. This plate does not extend completely round the fire-box, there being an opening left both at the top and bottom, as shown, and the plate and angle irons thus form two channels of rectangular section, each extending nearly half round the fire-box at the point where the bridge is situated. The heat from the fire-box causes a quick current to rush through these channels, and thus the circulation of the boiler is promoted, and the fire-box plates protected at the point where they are most liable to damage.

"The results which have been obtained with the boiler we have described have been most satisfactory, and we are informed by Mr. Webb that during a trial of a week of 54 working hours, the engine being during this time almost constantly on the move, the quantity of anthracite coal burnt was 2 tons 8 cwt., and the quantity of water evaporated 5,040 gallons, or at the rate of 9·37 lb. per pound of fuel. With the same boiler and grate the quantity of best Staffordshire coal burnt during the week of 54 working hours was 2 tons 15 cwt., and the quantity of water evaporated 5,020 gallons, or 8·15 lb. per pound of fuel. These are both very good evaporative results."

Fig. 1.





BOILER FOR SWITCHING ENGINES—LONDON & NORTHWESTERN RAILWAY.—Fitted with Water Grate for burning Anthracite Coal.

A Veteran Conductor.

The Cedar Rapids (Iowa) *Times* thus speaks of one of the passenger conductors in the employ of the Burlington, Cedar Rapids & Minnesota Company: "He is without doubt the champion railroadist of this section. He commenced railroading in 1836—thirty-five years ago. Ran a passenger train twenty-five years; never had a serious injury himself, and no passenger on his train was ever seriously injured. Instead of leaving his passengers behind, he has on two occasions during his railroad career, brought in a passenger more than he started with—young travelers, to be sure, but live passengers. He is 64 years old, weighs 210 pounds and does as good a day's work as any man on the job."

Contributions.

PRACTICAL FIELD ENGINEERING.

NO. X.

CATTLE GUARDS.

To avoid the trouble and expense of building fences the entire length of a line of railroad, and to prevent live stock from passing from one field to another on the farms and plantations through which the road runs, cattle guards are constructed. Of course the simple building of these guards does not of itself release the railroad company from its implied contract to securely fence its road; but it very often happens that a release can be thus obtained by special contract with the land-owners, and in such case a guard must be made at each point where the line of road crosses the dividing fence between two fields. In crossing public and private roads a cattle guard must be placed in the line of fence on each side of them to keep good these lawful barriers, provided the company does not wish to take the consequences that may flow from obstructing such private roads. It would be well for the engineer to carefully examine the statutes of the State in which the railroad is situated, and become thoroughly acquainted with the laws governing railroads, especially in the matters of right of way and fencing. Grave mistakes and troublesome litigation may thus be easily avoided.

No matter how the railroad line crosses the line of fence, the cattle guard should be put in at right angles with the former.

Cattle guards improperly constructed and ill repaired have been the cause of a long list of frightful accidents involving great loss of life and property, and it cannot be too earnestly urged upon the engineer to give this subject careful thought and attention. It is frequently less expensive at the outset to construct the cattle guards of a road on the very best plan, and it certainly is economical in the end, whatever be the first cost.

The best cattle guard is a deep pit, at right angles with the line of the road, walled with stone. Four feet is a good depth, with a width of eight feet in the clear. If stone for the walls cannot be had, crib-work of oak timber will answer very well. Sometimes, where the cattle guard is be put in in a considerable embankment, two bents, as in the case of an open culvert, may be made to answer the purpose, and at the same time form a passway for cattle under the roadway.

The ill-contrived slat-work traps used on many roads as cattle guards cannot be too rigidly condemned. They are standing invitations to disaster. A frightened cow will, when running before a locomotive, rush madly upon the deceptive slats, fall through or flounder about till the crash comes, and you have a dead cow, if nothing worse, and the engineer is to blame! The cause of all this lies, first in the shallowness of the pit, and, second, in the slat-work. If the former is deep enough, the latter is useless; and, on the contrary, the slats combined with an insufficient pit are the best possible means of deceiving cattle and luring them to destruction. I once found this sort of *guard*(?) stuck full of sheep, and by hard work got the poor animals out just in time to clear the track for an express train running at the rate of thirty miles an hour!

To construct a good cattle guard, set out its center line with your transit at right angles with the center line of the railroad location, if on a tangent, and if on a curve in the direction of a radius of the curve. Drive a stake in the center and mark it "cattle guard No. 1, 2, 3, etc.," as the case may be, and in the line of the guard drive two more stakes to mark the end of the pit. This is sufficient. If the bosses of laborers are properly instructed, they can with a tape line or measuring rod set out the width. If stone is used for the walls, the engineer must see that a proper foundation is secured and that the masonry is finished in a workmanlike manner. No botched jobs should be received.

Cross-ties are not to be used on cattle guards. The iron is for obvious reasons laid on the stringers, and I have found it best to make these stringers ten inches by fourteen inches at the cross-section.

Great care should be taken by the engineer to have the tops of the stringers of cattle guards precisely at grade. Nothing gives to a new road a more slovenly look than for the points where guards are inserted to be marked by abrupt upheavals or depressions in the surface of the permanent way.

It often happens that the engineer cannot give personal attention to the constructing of every cattle guard; he should therefore set, with his level, a grade stake near each side of the pit, to guide the workmen in properly adjusting the stringers. It is handiest to drive the stake until the top is to grade. A cross mark of red keel will serve to indicate its use, and the workmen must be instructed in the matter.

Quite frequently an open culvert may be made to serve the double purpose of cattle guard and viaduct for water, with very little additional work; and whenever a culvert and cattle guard are indicated near each other on the working profile, the engineer should examine to see whether the water-way may be turned so as to make one opening serve for both. Generally a few minutes' work with your level will definitely settle the question of practicability in matters of this kind.

Cattle guards should be so constructed that the fences may be easily joined to them at each end in such a manner that even small hogs cannot pass. This is a matter too often overlooked by field engineers, and the consequence is that many cattle guards are ornamented at the ends with piles of old rails and condemned cross-ties, as if to solicit conflagration.

If the engineer in going over the line to inspect the cattle guards and other special works finds that the stringers of any are a little above grade, he must not fall into the common error of allowing the workmen to *adze down* the stringers, but he must see that the walls are lowered, even if they be of stone. This rule must be strictly observed, unless the correction to be made is very slight. If, on the other hand, the stringers are found to be too low, let the walls be made higher. Never block stringers up by putting bits of wood under them. Number one smash-ups have resulted from this by the spreading of the stringers or the working out of blocking. If the pits of cattle guards are to be walled with timber, they should, whenever it is practicable, have a tile drain to keep them from filling with water in rainy seasons, as section hands are not likely to examine into the condition of submerged timbers, and an accident will pretty surely some day result from unobserved decay and a consequent lack of repairs.

To prevent the spreading of the stringers of cattle guards, they should at each end be securely spiked to a timber cap-sill, or embedded in the masonry of the walls. And while on this subject it may be remarked that in laying the iron on cattle guards the joints ought to be brought near the middle of the stringers, since if they are allowed to come near the end of the stringers the iron will have little binding strength, and the whole structure may be injured by the "rocking" or vertical vibration caused by the transit of heavy trains. The careful engineer will instruct the bosses of track-laying in this matter.

It is not best generally to make any arrangement for pedestrians to cross a cattle guard. It is better for those who walk on railroads to learn to "balance on a rail," or to turn aside and climb over a fence than to put a foot-plank in the middle of a guard, thus somewhat hiding the pit and tempting cattle to try to cross.

The crib-work walls for cattle guards are made by constructing a pen of timber, each stick of which should be a square foot in cross-section and hewn on three sides. The unhewn sides of the sticks are placed against the earth walls of the pit, and the ends of the cross or end sticks are cut down to half thickness, thus forming a solid timber lining for the pit, which will for a number of years be scarcely less rigid than masonry, especially if the material is white oak or burr oak, cedar or the heart of the southern pine.

The engineer ought to inspect cattle guards very carefully with regard to the materials used in their construction. The stone should be such as will stand either moisture or exposure to the dry air, and its strength such as will resist great pressure and pounding. Timber having even the slightest indication of decay should never be used where it will be subject to the action of moisture, and it is therefore unfit for the walls of cattle guards.

The next paper of this series will treat of road crossings and pass-ways.

HOOSIER.

The Problem of Overtaking a Locomotive.

In the RAILROAD GAZETTE of October 12 we presented the following problem:

"If a freight locomotive, capable of running at a maximum speed of 40 miles per hour 40 seconds after it starts should by accident escape without any one on it, and five minutes after a passenger engine, capable of running 50 miles per hour in 50 seconds from the time the throttle valve is opened, should start in pursuit, how far and how long will they run before one overtakes the other? It is assumed that the speed of the engines is uniformly accelerated from the time they start until they reach their maximum speed, and that the track is level and unobstructed."

We have received the following solutions of this problem:

LIBERTY, Ind., October 23, 1872.

TO THE EDITOR OF THE RAILROAD GAZETTE:

Divested of any "mathematical rubbish," the following answer to the problem in the GAZETTE of the 12th instant is submitted:

Distances run by freight locomotive and passenger engine in attaining their maximum speeds, 1,173⅓ and 1,833⅓ feet respectively; time out, of each, when collision would occur, 25⅔ and 20⅓ minutes; and entire distance run, 16 miles and 4,986⅔ feet.

A. H. C.

TO THE EDITOR OF THE RAILROAD GAZETTE:

In 5 min. and 50 sec. freight will have gone

$$5\tfrac{1}{3} \times \tfrac{35}{30} + \tfrac{1}{3} \times \tfrac{35}{30} = 3\tfrac{1}{9} \text{ miles.}$$

In 50 sec. passenger will have gone

$$\tfrac{5}{6} \times \tfrac{35}{30} = \tfrac{7}{6}.$$

Freight then has a lead of

$$3\tfrac{1}{9} - \tfrac{7}{6} = 3\tfrac{11}{18} \text{ miles.}$$

Since passenger gains 10 miles per hour, it will bump in

$$3\tfrac{11}{18} \text{ hours} = 19 \text{ min. } 55 \text{ sec.;}$$

or in 20 min. 45 sec. from time of starting.

Distance traveled in this time equals (passenger)

$$19\tfrac{1}{18} \times \tfrac{35}{30} + \tfrac{7}{6} = 16\tfrac{1}{2} \text{ miles.}$$

Freight travels 25 min. 45 sec., or 16½ miles.

New York, October 31. B.

B. Bondeli sends the answers to the problem simply, giving 16½ miles, for 25 min. 44½ sec. for the time from starting the first engine.

A Wooden Railroad.

Some time ago we copied an item regarding a new wooden railroad in Michigan, constructed for carrying lumber to a railroad station. This road was constructed by Mr. Samuel Rogers, a dealer in and manufacturer of lumber in South Haven, to whom we and our readers are indebted for the following description of his railroad, which is of a kind likely to be very useful in many parts of the country:

The length of the road is 2¼ miles, leading from the junction of Chicago & Michigan Lake Shore and Kalamazoo & South Haven railroads, through a tract of timbered land to a steam mill on Ousterhout Lake. The gauge is 4ft. 8in. The steepest grade is 186ft. to the mile, the rest of the road being nearly level.

Ties are laid 4ft. apart. The rail is 4x5in., 12ft. long, of beech or maple (beech preferred, on account of its straighter grain), fastened to the tie by a dove-tail cut in the tie and secured by a key a foot long, 2in. square at one end, and 2x1½ at the other.

The cars are twelve feet long; the wheels of cast iron, weighing 200 lbs. each, 24in. in diameter; the base 4in., flange, 2½in. The axles are made of 2¼in. square iron, bearings turned on the end for the wheel. They are stationary, the wheels turning on them.

The cars are drawn by one horse, carrying 1,500 feet of green pine lumber. The brakes are worked by a lever, and one man can stop a car instantly, on any grade. The switches are built the same as on an iron track.

The road cost $1,000 per mile and includes a trestle 12 feet high, 54 rods long, over a ravine, and a bridge 80 rods over a swamp, consisting of cross-logs, upon which are laid stringers, flatted upon one side, planked with ribbons, or light rails, 2½x4in. for cars to run on.

The iron work of a car—wheels and axles—cost $75. The car can be made complete for $90.

A man and horse cost $3 per day, and perform four trips, making cost of transportation 50 cents per 1,000 feet.

A similar road has been constructed in this county by Messrs. Packard & Co., and has been in operation four years. It is still in good condition. Any part of a road built in this manner may be easily renewed, as occasion requires.

The Radley & McAllister Smoke-Stack.

TO THE EDITOR OF THE RAILROAD GAZETTE:

In your description of our new smoke-stack, in your paper of October 19, you describe it as intended for burning coal *exclusively*, and not wood. As this may produce misapprehension in the minds of many of your readers, we beg to call your and their attention to the error, and say that our new stack is designed, and is now in use, for burning both wood and coal, and is, we think, a great improvement over our old stack, which has been so extensively used for many years for burning wood in all parts of the country. The new stack has the advantage of giving a much freer exhaust than the old one, and thus delivers the smoke and sparks clear of the train, and is, therefore, cleaner and more agreable to passengers than our old pattern.

Trusting that you will do us the favor of making the correct on we are, yours very respectfully,

JAMES RADLEY.

President Radley & McAllister Manufacturing Company.

New Constitution of the General Passenger and Ticket Agents' Association.

In our report of the recent session of the General Ticket Agents' Association we noticed the adoption of a new constitution and indicated its chief differences from the old one. We give below the report of the committee on which the revision was based, as well as the constitution itself in full. This committee was one on "Preamble and Resolutions," and consisted of Messrs. A. A. Barnes (Memphis & Charleston), A. E. Touzalin (Burlington & Missouri River), W. B. Davenport (St. Louis & Southeastern Consolidated), J. W. Cary (Lake Shore & Michigan Southern), and D. M. Boyd, Jr., (Pennsylvania). This report was as follows:

"The Committee appointed to consider the resolution offered by Mr. Shattuc, providing for the enforcement of article 7 of the by-laws of this Association, respectfully report that they heartily indorse the sentiments expressed in the resolution, but find them to be already in force and embodied in the present by-laws. In this connection, your Committee would respectfully call attention to what they consider fundamental defects in our present organization as a legislative body, for the regulation of matters pertaining to through passenger business in its varied and important features. The two most important defects we consider to be: (1). The want of any power or control by which the Association can enforce its action and the rates which it may establish; (2). The members of the Association as a general rule are not properly authorized, and cannot promise that their managers will concur in the action of the Association. We believe that these and many other minor defects can be cured only by the reorganization of our Association on the basis that every member admitted under the new constitution shall be empowered with written authority by his President, managers or board or directors, to fully represent his line in all passenger and ticket matters, and shall be empowered to adopt the constitution and by-laws of the Association as the rules governing his road in all matters of general business where his interests conflict with those of other lines, By carrying out this step the moral power of our conventions would be largely increased, and we shall be able to rectify errors and wrongs over which we now have no control. We should also be able to better regulate the system of through passenger rates and tickets, which, by its great and growing extent, demands the most enlightened consideration and harmonious action on the part of all lines. We would, therefore, respectfully recommend that a committee be appointed who will proceed to perfect a plan for reorganization on the foregoing basis, and report at the next meeting of our Association."

When this report was submitted, it was amended so as to recommend the appointment of a committee to report at the current meeting, and Messrs. A. V. H. Carpenter (Milwaukee & St. Paul), F. R. Myers (Pennsylvania Company), Thomas L. Kimball (Union Pacific), James Charlton (Chicago & Alton), A. E. Touzalin (Burlington & Missouri River), A. A. Barnes (Memphis & Charleston), and John N. Abbott (Erie), were appointed such committee.

The following is the constitution which they reported, and which the Association adopted:

ARTICLE I. The Association, hereby constituted, shall be styled the "General Ticket and Passenger Agents' Association."

ARTICLE II. Each railway corporation and transportation line in the United States and Canadas, issuing tickets from other railway or transportation lines, shall be entitled to one representative in this Association upon the following terms:

First. Such representative shall be authorized by the general manager of his company to act for and bind the same a

fully as the general managing officer thereof could do if present in person.

Second. He shall present credentials from such managing officer of the tenor following, viz:

——— Company,———18—.

To the General Ticket and Passengers Agents' Association:

——— is hereby constituted the representative of the Passenger and Ticket Department of this company, at all meetings of the Association, and, as such representative, is invested with full power to act for and bind this company in making rates and divisions for the transportation of passengers and baggage, and the adoption of rules and regulations for the execution of the foregoing powers; and to act in such capacity until the above delegated authority is revoked and notice of the same given to the Secretary of the Association. (Signature.)

Third. Such credentials shall be presented to the Secretary, and by him referred to the Executive Committee, and, upon approval of the same, indorsed thereon and signed by a majority of such Committee, he shall enroll such company as a constituent of this Association.

Fourth. Upon such representative, so accredited, signing an agreement to abide by the constitution and by-laws, he shall become a member of this Association.

Fifth. A special representative for a particular meeting, presenting special credentials from the managing officer of any constituent company authorizing him to act in place of the officer in charge of the Passenger and Ticket Department of said company, shall be received as such representative for that meeting only.

ARTICLE III. The President and managing officers of the several companies enrolled as constituents of this Association shall be *ex officio* members of the same, when present at its meetings; and said officers shall constitute a Board of Arbitration for the final settlement, upon appeal by the minority, of all questions arising under this constitution or the by-laws of the Association.

ARTICLE IV. The intent hereof is that when several lines of road are operated by one general management, and have the same general passenger or ticket agent, they shall be entitled to but one representative.

ARTICLE V. The Association shall hold two stated meetings in each year, at such times as may be fixed in the by-laws. The location, except in cases of emergency to be provided for in the by-laws, shall be designated by each preceding meeting, by a majority of all the members in attendance at such meeting. Each member, when his name is called, shall designate the place of his choice, and the place named by a majority in attendance shall be fixed as the place for holding such meeting.

ARTICLE VI. The officers of this Association shall be a President, Vice-President, Secretary, and an Executive Committee of three. The President and Vice-President shall be elected annually, at the regular spring meeting. The Secretary elect shall serve until a successor is elected. The Executive Committee shall be elected and hold office respectively, as follows: One until the spring meeting in 1873; one until the fall meeting in 1873, and one until the spring meeting in 1874; and each regular meeting of the Association hereafter, one member of the Committee shall be elected, who shall hold his office for the term of one year and six months, or for three regular meetings of the Association. The President and Vice-President shall be members of the Executive Committee *ex officio*. Each of the officers shall be elected by ballot, and the person receiving a majority of all the votes cast shall be declared elected to the office, and serve until his successor shall be elected. No one who is not a member of the Association shall be eligible to any office, nor hold office longer than he continues a member thereof.

ARTICLE VII. 1st. It shall be the duty of the President to preside at the meetings of the Association; to take the vote on all questions of debate; to preserve order, and appoint all committees, except as herein provided, and perform such other duties as the by-laws shall prescribe.

2d. It shall be the duty of the Vice-President to preside during the absence of the President, and in case of the disability of the President, from any cause, to act as President during the continuance of such disability.

ARTICLE VIII. It shall be the duty of the Secretary to keep correct minutes of the proceedings of each meeting, and to publish the same after each session of the convention. He shall also notify each member by circular of the time and place of each meeting, and attend to all other duties pertaining to the office.

ARTICLE IX. It shall be the duty of the Executive Committee to prepare a synopsis of the business requiring consideration by each meeting, and report the same as soon as the meeting is organized; to settle all questions arising under this constitution or the by-laws of the Association, in vacation, and report their acts to the next regular meeting of the same for approval or revision; to call special meetings when the majority of the Committee deem necessary, under such regulations as may be provided in the by-laws; to fill any vacancy in their own board, happening in vacation; to appoint a Secretary *pro tem.*, in case of the disability or disqualification of the Secretary. In case of a vacancy occurring in both the offices of the President and Vice-President, the senior elective member of the Executive Committee shall be Acting President until the next regular convention, at which time (if a semi-annual convention) any vacancy in either of said offices may be filled by an election.

ARTICLE X. Fifteen members shall constitute a quorum to do business, but a less number may adjourn from time to time.

ARTICLE XI. The Association may adopt by-laws for executing the provisions of this constitution and regulating its proceedings.

ARTICLE XII. This constitution can be changed only by an amendment, to be offered at any convention, by a vote of two-thirds of the members then present.

ARTICLE XIII. This constitution shall take effect upon the adoption thereof, in open convention of the present "General Ticket Agents' Association," and the signatures thereto of fifteen or more members of the same; and the parties so signing shall be members of this Association until the first annual meeting thereafter, which shall be held in the city of Washington, D. C., on the last Friday but one in March, 1873, or at such other time or place as the Executive Committee may designate.

Improvement in Bridge Connections.

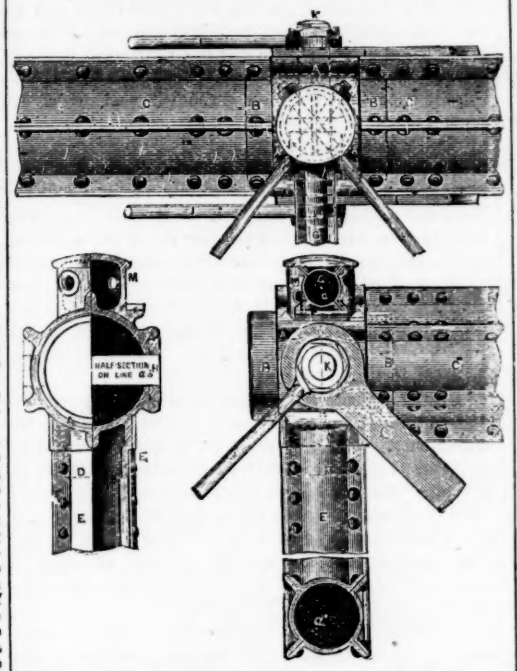
Messrs. Thomas C. Clarke and A. Bonzano, of Philadelphia, have patented the arrangement for bridge connections which we illustrate herewith. Fig. 1 is a plan; fig. 2 a side view, and fig. 3 an elevation partly in section. They describe their invention as follows:

"The connecting-piece, *A*, consists of a cast metal block or cylinder, having at the upper side a cylindrical projection, *M*; at the opposite ends annular projections, *B B*; an annular projection, *D*, at the lower side; and at one side of the projection, *M*, a socket, *F*. The arrangement of the said projections may be slightly varied, in accordance with the position to be occupied by the connecting-piece and by the character of the structure of which it forms a part. In the present instance, the projection, *D*, extends into and is riveted to the upper end of a hollow post, *E*; the adjacent ends of the two hollow sections, *C C*, of the top chord in like manner receive and are riveted to the projections, *B B*; and one end of the transverse strut, *G*, rests in the socket, *F*. In order to insure a firm and positive bearing of the connecting-piece against the strut, *G*, the projection, *M*, is perforated for the passage of two diagonal tie-rods, *L L*, each of which extends across the vertical axis of the projection, one being above the other, as shown in the drawing, and both being very nearly on the same horizontal plane as the axis of the strut. Owing to this arrangement the strains, applied through the tie-rods to the projection, *M*, are sustained by the strut, *G*. The said projection can, therefore, be much less in dimension than it would if the strut were differently situated and the entire strain had to be resisted by the projection. In the connecting-piece is a transverse opening, *H*, for the reception (in the present instance) of the through-pin, *K*, to which the main and counter diagonals, *I J*, are attached.

"The projections, *D B*, instead of being annular, may be octagonal or of other form, to coincide with chord-pieces or posts of corresponding sectional form.

Claim.

"The combination, with a connecting-piece, of a projection,



M, socket, *F*, or other support for the end of a strut, and recesses for the passage of diagonals, *L L*, arranged in respect to the said socket as described."

Constructive Materials.

Of the numerous papers which are read and discussed every year by our scientific societies, but an exceedingly small number treat of the constructive materials employed by the engineer, or of the means by which these materials can be improved in quality. And yet the subject is one of vast importance, and one which can decidedly be best dealt with at meetings where practical men have an opportunity of adding the results of their unpublished experience to those which have been formally recorded by experimenters. We are aware that in some instances a notion that trade secrets were being interfered with would prevent the communication of many facts of value; but this feeling is, we are glad to say, very far from being universal, and we believe that much good might be done by a thorough ventilation of the whole question.

The fact is that we are rapidly approaching a time when some better materials than we have now generally at our command will become an urgent necessity, for the whole tendency of engineering progress is toward imposing upon constructive materials all the strain they will bear, and in many instances more than is good for them. Civil engineers continue to plan larger and bolder bridges and similar works, while their mechanical brethren are building larger and larger engines, increasing steam pressures, and working machinery at higher speeds. Under existing circumstances there is a limit to all this, and this limit is now nearly reached in many cases. It is true that bridges of considerably larger span than any yet constructed may be built with the materials at present at our command; but this can only be done by incurring an expense which is prohibitive in any but very exceptional instances, on account of the enormous amount of material which would have to be used to obtain a limited carrying capacity. Again, by resorting to water-tube boilers, it is possible for mechanical engineers to avail themselves of steam at a far higher pressure than is now used, but such boilers are not free from objections, while the high temperature of such very high-pressure steam renders lubrication extremely difficult, and causes it to exercise a destructive action on valves, pistons, cylinders, &c., which our present knowledge does not enable us to overcome. Even with steam of ordinary pressures of 60 or 70 lbs. per square inch, difficulties are beginning to arise from the increase in the size of engines, and this is particularly the case in marine engine practice, where a material which could advantageously replace cast-iron for the construction of cylinders, and similar details, would be gladly welcomed. In what we may term manufacturing engineering, too, economy of production points toward using machines capable of taking heavier cuts, and running at a higher speed; but here we are met by the difficulty of getting tools which would stand the increased work thus thrown upon them; and although Mr. Mushet, Messrs. Vickers, and other steel-makers have of late years made great progress in the manufacture of tool-steel, this is a direction in which further improvement is and always will be acceptable.

Under these circumstances the questions to be considered are: In what direction are we to look for improved constructive materials? and How can the discovery and commercial manufacture of such materials be best promoted? To the former of these questions it is, of course, impossible to give a complete answer, although we may give some hints on the subject; but the latter may be more easily responded to. If an engineer nowadays is called upon to construct a bridge of unusually large span, or if a mechanical engineer has to make an unusually light boiler capable of standing a high pressure, he is not content with employing the constructive materials ordinarily found in the market, but specifies for steel or iron capable of resisting satisfactorily high-test strains. Under these circumstances he may obtain a material having a constructive value some 20 or even 30 per cent. greater than the average of that ordinarily manufactured, but he will, of course, have to pay for this advantage a considerably increased price. Now, although this increased price is partly necessitated by increased cost of production, it is in very many cases due to no unimportant extent merely to the fact that the demand for very high-class material is an exceptional one. The furnishing of such material, in fact, necessitates the manufacturer's departing from his usual routine of business, and hence expenses are incurred which would vanish if the demand for the very best materials was constant instead of intermittent. In other words, we believe that users of iron and steel could obtain a considerable better average quality of material at a very moderate increase of price if they would simply take the trouble to ascertain systematically the quality of the materials they employ. What is wanted is a more general abandonment of the brute-strength system of construction, and a more rigid specifying of good materials combined with careful testing, to insure that such materials are supplied. With a more general demand for high-class products, there would be an increased development of the manufacture of such products, and much of the energy and skill now devoted to producing materials which are exceedingly cheap would be more profitably turned to account in manufacturing products which should be exceptionally good.

We now come to the other and more difficult question to deal with:—In what direction are we to look for improved constructive materials? And, as we have stated, any answer that we may make to it will necessarily be imperfect. There are, however, certain indications observable which seem to point out some of the directions in which progress is to be expected. For instance, at the present time almost all classes of engineers are being benefited by the vast advance which has been made during the last few years in the manufacture of steel, and few will deny the great constructive value of that material. But while this is the case there can be few users of steel who are not aware that the steel bars or plates ordinarily found in the market are composed of a vastly different material to the best steel obtainable. There are few of us who have not at some time or other had occasion to examine samples of steel prepared to illustrate the value of some particular manufacturing process, samples which would exhibit extraordinary ductility and resisting power, and which were, in fact, almost as superior to the best ordinary steel of commerce as that material is to the most inferior brands. Now these samples are in the majority of instances, we regret to say, not produced through any peculiar excellence in the process of which they are supposed to illustrate the value, but are simply the results of excessive care in the manufacture; and taking into consideration the great value to engineers of a material possessing the qualities of such samples, it is scarcely too much to hope that the care which is expended on these productions may ultimately be exercised on a much larger scale and with proportionately great results. That even now steel plates can be produced on a commercial scale of a quality far superior to that ordinarily met with in the market, is proved by what Mr. F. W. Webb is now doing at Crewe, where he is making regularly Bessemer steel boiler plates having a breaking strength of 34 tons per square inch, elongating 25 per cent. before fracture, and of such ductility that a ¾in. hole punched in each sample strip 2¼in. wide may be drifted out to 2 inches diameter without causing failure.

But it is not only in the general quantity of wrought steel that a vast improvement may yet be expected. We anticipate an even greater advance in the development of cast metal. The leading steel makers in this country and on the Continent can now turn out steel castings, the production of which would have been deemed utterly impossible not many years ago, but such castings are still very far from being all that we believe they will be made. At present the excessively high temperature at which it is necessary to run the steel, and consequently the great shrinkage which takes place during cooling, is a difficulty in the way of producing castings of complex form, or having parts of very limited thickness, while the greater or less porosity of many of the castings renders them inapplicable in numerous instances where their great strength would otherwise render them especially valuable.

There appears here to be an indication that what is wanted is an alloy of steel, which should retain the strength of the latter while having a lower melting point and increased fluidity. That such an alloy, or its equivalent, will ultimately be discovered we see no reasonable reason for doubting. And here we may say that we use the word "alloy" in its broadest sense, as meaning not merely a mixture of one metal with another, but a mixture of a metal with any element, metallic or otherwise. The whole subject of alloys is one of vast importance, and one which has never yet received the full attention it deserves, although many of our metallurgists and chemists, and notably Dr. Crace Calvert, have contributed much valuable information concerning it. We in fact know of no more promising field of research than that which the investigation of alloys offers, and we trust that no great time may elapse before it is more thoroughly cultivated.

An important instance of the effect exercised on the properties of a metal by the admixture of a very small percentage of a foreign substance is afforded by the "phosphor-bronze" of MM. Montefiore-Levi and G. Kunzel, and as this alloy promises to be one of the "materials of the future," we may specially advert to it here. From particulars of careful experiments with this material now before us, we find that the addition of a very small percentage of phosphorus to gun metal containing 10 per cent. of tin increased the elastic limit about 35 per cent. and the breaking strain per square inch of the original section 80 per cent.; while one sample of phosphor-bronze, containing 6.2 per cent. of tin had a breaking strain of over 51,000 lbs. per square inch of original section, and elongated 10 per cent before fracture. Judging from the samples we have seen, also, the phosphor-bronze appears to be capable of making very close and dense castings, while the property it possesses of casting well in metal moulds is one of very great value in a number of instances.

It is, however, not only by the introduction of an alloy that we may be furnished with a valuable addition to our constructive materials; there is a large scope for improvement in our treatment of the materials now at our command. The experiments of Sir William Fairbairn long ago showed how greatly the quality of cast-iron might be improved by successive remeltings, while more recently Sir Joseph Whitworth has been producing some remarkable results by casting steel under pressure. The effect on steel, however, of repeated meltings, or of long-continued fusion under suitable protection from oxidation, has, so far as we are aware, not been investigated, while the process of casting under pressure can scarcely be considered as fully developed, so that in both these directions there may arise improvements in the future.

It is scarcely necessary that we should dwell here upon the value of a material which should be procurable at a moderate price, be capable of being cast into even complex forms, and be possessed of a strength and ductility equal, let us say, to fairly good wrought-iron. To some limited extent such qualities are supplied by malleable cast-iron, but malleable castings cannot easily be made of any great size, except, perhaps, by McHaffie's method, while their liability to twist during the annealing process is in many cases a serious obstacle to their employment. If such a material as we have alluded to could be produced at a cost even as great as that of good wrought-iron, the demand for it would be enormous, and there would, in fact, be few articles now built up of wrought-iron plates which could not be made of it with advantage, while it would take the place of the cheaper cast-iron in an immense number of instances. The prize is one well worth trying for. Who will secure it?—*Engineering.*

RAILROAD GAZETTE

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Editorial Announcements.

Correspondence.—*We cordially invite the co-operation of the railroad public in affording us the material for a thorough and worthy railroad paper. Railroad news, annual reports, notices of appointments, resignations, etc., and information concerning improvements will be gratefully received. We make it our business to inform the public concerning the progress of new lines, and are always glad to receive news of them.*

Inventions.—*No charge is made for publishing descriptions of what we consider important and interesting improvements in railroad machinery, rolling stock, etc.; but when engravings are necessary the inventor must supply them.*

Articles.—*We desire articles relating to railroads, and, if acceptable, will pay liberally for them. Articles concerning railroad management, engineering, rolling stock and machinery, by men practically acquainted with these subjects, are especially desired.*

Advertisements.—*We wish it distinctly understood that we will entertain no proposition to publish anything in this journal for pay,* EXCEPT IN THE ADVERTISING COLUMNS. *We give in our editorial columns* OUR OWN *opinions, and those only, and in our news columns present only such matter as we consider interesting and important to our readers. Those who wish to recommend their inventions, machinery, supplies, financial schemes, etc., to our readers can do so fully in our advertising columns, but it is useless to ask us to recommend them editorially, either for money or in consideration of advertising patronage.*

URBAN TRAVEL.

In every populous town and city in this country there is a demand for better means of locomotion and improved facilities of getting from one place to another. As we took occasion a short time ago to point out, there are indications that the character of all metropolitan life will soon be changed by the effect of better and improved facilities of travel. In all our large cities there is now an obvious tendency to concentrate business in one common center and to distribute population over larger areas, and it is becoming each year possible for business men to live at greater distances from their warehouses and counting-rooms. Owners of real estate, who are proverbially conservative, have at last been compelled to realize that the value of their property is directly dependent upon the facility with which it can be reached from the centers of business. All our large cities are each year advancing and encroaching upon the country, and the extension of each new block makes a demand for better means of transportation and travel. That our horse railroads are inadequate to meet the demands which are made upon them, is painfully obvious every morning and every evening wherever they are used. Passengers are crowded into them, without any regard for their comfort, under the plea that the railroad company cannot afford to furnish cars enough, when they are needed to accommodate all who want to travel, thus admitting that they are unable to do what the public convenience demands.

That the plea of inability to supply better accomodations, under ordinary circumstances, for the money received, is utterly futile, we think it would not be difficult to show; but if the city railroad companies urge this plea they must not be surprised if the public should take them at their word, and demand some better system of travel. Such a demand is very likely to be hastened by the epidemic now so prevalent among the horses in New York as well as other cities, which has shown the inefficiency of the present means of travel, under unfavorable circumstances; the fact being that the equipment of none of the city railroads is adequate to furnish the facilities under ordinary circumstances which the public have a right to demand, and, therefore, whenever any emergency, such as the present, or a snowstorm, occurs, or an unusual number of people must be carried, the railroad companies are utterly unable to perform the service, in consideration of which exclusive charters have been granted to them to occupy our streets. It matters little, however, to the public whether the want of proper accommodation is due to the avarice of the companies or to the inefficiency of the system of transportation in use; what is wanted is better facilities of locomotion, and there are strong indications that people are assuming an attitude in which they will demand either that the railroad companies shall accommodate them better, or else make way for other parties who will.

That horse power must be supplanted by steam power on city railroads is, we believe, now a certainty; and there is no field of engineering which now offers such an immediate and, we believe, certain reward, as that of the construction of locomotive engines adapted to that service. The so-called "dummy engines" have almost universally gone into disuse, on account, we believe, of the engine and car being inseparable, so that when the engine required repair the car was useless, and *vice-versa*. The smoke and the oil and dirt from the engine were an annoyance to passengers, and their close proximity to the boiler was uncomfortable to such as are nervous. The experience gained by their use has therefore, we think, made it obvious that an engine for street-road use must be detached, or rather detachable, from the cars. It must also be as nearly noiseless in its operation as possible, and no exhaust steam should be allowed to escape, either from the cylinders or safety valves. The latter, we believe, can be best prevented by careful firing and by having a boiler so large that no sudden variation of temperature in the water contained in it will be either possible or necessary. With a small boiler, in which it would be necessary to generate a relatively larger amount of steam, and in which any slight irregularity in firing would cause the steam either to fall very low or else blow-off, it would be impossible, even with the most careful firing, to prevent the latter; but with a large mass of water to absorb heat and give off steam, a reasonable degree of watchfulness and care of the fire would make it possible to avoid blowing off. At the comparatively slow speed at which it would be necessary to run on the streets, a geared engine, or one whose cylinders make more strokes than the wheels do revolutions, possesses some advantages. One of these is that the cylinders and connections may be lighter and the pistons work at a higher speed, and therefore use steam more economically than if they are connected directly with the driving-wheels. The amount of steam exhausted at each stroke being less than it is when direct-acting, and therefore necessarily larger cylinders used, it is much easier to make it noiseless than when there are slower but more powerful blasts. On the very steep grades which occur so frequently on the street railroads an engine must exert much more power than on a level. It is therefore desirable to be able to change the engines from a slower to a faster speed, so that on the steep inclines more power can be exerted than is required on a level, and a higher speed be developed on the latter. It seems probable, too, that the exhaust up the chimney must be avoided, and a draft be created by other means. This was for a long time very effectively done on the first engines built for the Baltimore & Ohio Railroad, on which a revolving fan, driven by the exhaust steam, turned another fan which forced air into the fire. There was a sort of heater, which was really a surface condenser, attached to this, and which accomplished the double purpose of heating the feed-water and condensing the steam. These were put on the engines before the effect of turning the exhaust steam up the chimney was known, and they were used very effectively for many years.

The chief objections which have always prevented the introduction of steam engines on city railroads have been their alleged tendency to frighten horses, and the danger of running over foot passengers and of collisions with other vehicles. The first has undoubtedly been very much overestimated, and the second, with properly constructed engines, would not exist, as an engine of proper dimensions would be as easily handled and could be more quickly stopped than a car with a team of horses.

The subject is now likely to attract attention anew, and, owing to the "horse disease," the Board of Aldermen have given permission to run "dummy engines" on the streets of New York for thirty days. It is of course absurd to suppose that any of the railroad companies will be induced to go to the expense of getting such engines, even if they were procurable, to run for that length of time; but if any fortunate person now had an engine ready, the public and the railroad companies are doubtless in a mood to give it a fair trial.

Nearly, if not quite, all the attempts which have thus far been made to make a locomotive for this service have been by what a friend very aptly calls "tin-pan engineers;" that is, men without practical experience or sound theoretical knowledge, or, what is equally important in such work, what might be called mechanical logic, or capacity to draw sound deductions from the data and conditions to be considered.

There is nothing about the requirements of street-rail road service which indicates that any very extraordinary difficulties must be encountered, but only that considerable skill must be exercised in order to adapt the engine to the circumstances under which it must be operated and to the work to be done.

RAILROAD ASSASSINS.

We hear occasionally of some attempt, not infrequently successful, to throw a train from the track of a railroad, generally either by obstructing the track or by misplacing a switch. It is not easy to believe that such aggravated and stupid malice could exist, and we involuntarily look for some explanation which will account for the accident by negligence, or ignorance, and avoid the necessity of believing that any human being can have deliberately aimed at the destruction of innocent men, women and children, most or all of whom are unknown to him, and against whom he cannot even have the slightest prejudice or dislike. But too often the malice is unmistakable, and the number of instances in which this is the case is so great that we are lead to believe that the danger from this cause is greater than is generally supposed, and that it deserves the attention of railroad companies, and perhaps their combined action. As the isolated cases, reported briefly and often obscurely in the newspapers, hardly leave any lasting impression on the mind, we present herewith a list of cases which we have noted as occurring within the past three months—August, September and October. They are as follows:

On the 10th of August, detectives of the New Orleans, Jackson & Great Northern Railroad discovered two negroes, who were in the employ of the company, in the act of removing spikes from the rails near Magnolia, La. Near that place, some two weeks earlier, an accident by which several persons were injured had occurred, and it was found that rails had been displaced maliciously.

The Detroit *Tribune*, of August 15, says: "On the morning of the 11th, the trackmen on the Lake Shore & Michigan Southern discovered, between Manchester and Norvell, a railroad tie laid across the track loaded with railroad iron and fence rails. After a short search they found the perpetrator, who gave his name as Thomas Bequit, and his age at 19. He is a painter, and formerly lived at Marshall. His father, he said, lived in Detroit. On being questioned, he declared that it was his intention to demolish the express train, in hopes of causing a disaster sufficient to allow him to plunder the passengers. He stated that he had done what he had under instructions from two men in this city, but as he refused to divulge any names, it is thought to be without foundation. He is now in jail."

On the morning of the 19th of August, a farmer on the line of the Jacksonville Northwestern & Southeastern Railroad found several pieces of timber piled on the track at a steep grade, about a mile and a half from Jacksonville, Ill., a passenger train being due in about two hours.

About midnight, on the 30th of August, an accident was caused on the Louisville, Cincinnati & Lexington Railroad by the malicious misplacement of a rail on a very high embankment, and a fireman was killed and a baggageman seriously wounded in consequence, while the escape of a train-load of passengers who rolled down the steep bank seems miraculous. It is reported that an attempt to throw a train from the track at the same place had been made previously.

On the 3d of September some person misplaced a switch on the Erie Railway at Belvidere, N. Y., and put out the switch-light and filled the lantern with grass, evidently intending to prevent the discovery of the change in the switch by the train-men. The consequence was that a freight engine was ditched and the engineman and fireman wounded.

On the night of the 7th of September, a drunken man who had been expelled from a car on the Newark & New York Railroad for not paying his fare, turned a switch at West Bergen, N. J., in revenge, so that if it had not been discovered the next train must have been thrown from the track. (The question arises, where was the switch lock?)

On the Des Moines Valley Railroad, in Keokuk, on the evening of the 17th of September, a locomotive was completely wrecked and an engineman severely injured by the misplacing of a switch, which seems certainly to have been the work of malice.

On the 19th of September an obstruction was placed on the track of the Shore Line Railroad near New London, Conn., at a place where the embankment is 20 or 30 feet high. An express train was approaching, but the train-men discovered it in time.

On the morning of the 1st of October an enginema

and fireman were murdered 25 miles west of Philadelphia, on the Pennsylvania Railroad, by some bloodthirsty creature who removed a joint fastening and moved a rail, which caused an engine to go down a steep bank, and might easily enough have wrecked the long passenger train behind it.

On the evening of the 9th of October an effort was made to wreck a train on the new Cincinnati & Springfield Railway, by placing timbers across the track at a culvert near Kneisley's, Ohio. It was discovered by a working party in a hand car, who, however, ran into it and had several men hurt.

On the night of the 10th of October a track-walker on the Delaware, Lackawanna & Western Railroad crossed the canal bridge at West Paterson and passed on some distance, when he discovered that there was no light in the bridge-tender's cabin. Going back he found large stones piled up on the track. A special train was nearly due, and he tried to roll off the stones immediately, but finding them too heavy for him he went to the bridge-tender's cabin, where he found him lying on the floor, his hands and feet bound and his head tied up in a bag. He had been seized and tied by six men, who, doubtless placed the obstructions.

Here within three months we have eleven separate attempts to wreck trains, five of which caused accidents in which three men were killed and four wounded, while in some instances it was only by a hair's-breadth, as it were, that a long train of passengers avoided destruction. The plans were made to insure the greatest destruction possible, obstructions being placed on high embankments or at the approach of bridges, where a locomotive off the track would be most likely to drag after it the longest train to certain destruction. It certainly speaks well for the general vigilance of train and trackmen that so many of these obstructions were discovered in time, and for the effectiveness of the existing appliances for controlling a train and mitigating the effects of a shock or derailment that the accidents actually caused were no more destructive. But we fear we shall not always escape so lightly.

Accidents at best are likely to be serious enough; but when we have the human ingenuity usually exercised to avoid an accident exerted to make it certain, and its effects as destructive as possible, we may expect to have one at last more terrible than any now on record, and equal in fatality to some of the great steamboat accidents. The capacity of a railroad as an engine of destruction has never been fully developed, but it easily may be if men deliberately seek to use it as such, and its terrible efficiency in that direction may surprise us.

Since we cannot at once put an end to devilish malice in men's hearts, nor persuade the vicious that they do not even obtain the revenge they seek when they slaughter an innocent person—a mother and her babe, perhaps—to satisfy a grudge against some corporation officer or company servant, we should try to deter them by fear. Next to its fearful exhibition of a depraved human nature, the most discouraging feature of these crimes is the infrequency of the punishment of the criminals, and the want of publicity of such punishments. It seems to us that in such cases as these, where murder is attempted by wholesale, the railroad companies should spare no exertion to detect, arrest, and bring to sure punishment the criminals. Let them make it their common cause, and pursue those guilty of such atrocities with their united wealth, power and organization. Let them know that the search for them will never be remitted, and that while they live and are at large men are on their track. With almost a certainty of detection and conviction, we may be sure that such crimes would become extremely rare.

We take it for granted that convictions would be followed by severe punishment. We can hardly conceive of any more heinous crime, and, as malice and premeditation are unquestionable, it seems that it should receive the severest punishment known to the law. In some States the firing of a building in which people live is punishable with death, and certainly this does not so surely imply malice and murderous intent as the wrecking of a train. We will not say that the latter should always and everywhere be punished by death, bearing in mind the differing views on the subject of capital punishment, but it does seem that the average human life is not long enough to make imprisonment for life a sufficient punishment for a crime so devilish.

The Seabrook Accident.

The Eastern Railroad, which suffered so severely by the Revere accident a year ago, has again had the misfortune—misfortune seems the proper word in this case—to meet with a severe accident at Seabrook, N. H., by which three passengers lost their lives and seventeen persons were injured. The accident, plainly enough, was caused by a misplaced switch; but hitherto all efforts to discover how or by whom the switch was misplaced have been fruitless, and the case seems really mysterious. A local freight being stuck on a grade was pushed into Seabrook by an express freight. The local was turned on a siding at that station, but that the switch was turned back from the siding to the main track is proved by the fact that the express freight passed through the station, as well as by the direct evidence of the brakeman who turned the switch and those who saw him do it. But it is no less true that a few minutes later the Pullman train coming into the station at high speed (not stopping there) found the switch turned for the siding and ran into the rear of the freight train standing there, with the terrible results noted above. Moreover, a second brakeman of the local freight saw that the switch was misplaced, just before the Pullman train reached, and signaled it to stop, though too late. There seems to have been a very careful and searching examination at the coroner's inquest; and all the facts seem to have been brought to light except the vital one of the manner of the last turning of the switch from the main track to the siding. Mr. Dow, the brakeman who turned the local freight on the siding and moved the switch back to the main track, says that he did not lock the switch in that position, expecting soon to change it, but did put in the pin, so that it could not be turned without hands. It seems to have been the common custom to neglect locking switches in such circumstances, though the rules of the road require it; and it seems, too, that several of the trainmen were accustomed occasionally to do switching. The moral seems to be that switches should always be left locked, however short time they are left, and that switching should be done either by one person only, or only on the direct order of the conductor, who should be held responsible. In this case either the switch must have been changed by some person not connected with the railroad—which could not have been done had it been locked; or by some train-man who supposed he was acting properly—which could not have occurred were the switching done strictly by or at the orders of one person, supposing proper discipline to be maintained.

This unfortunate accident, besides indicating the necessity of greater strictness in the management of switching, has illustrated the value of some provisions which mitigate the effects of such accidents. The cars of the Eastern Railroad are provided with Miller's platform and buffer; but the train was partly made up of Maine Central cars, which had not this improvement. Next the engine was an Eastern express car; following came a baggage and mail car, a smoking car and a passenger without the Miller platforms; then two Pullman cars with those platforms. The smoking car was "telescoped" over the mail car ahead of it, while the express car ahead was not broken up and the Pullman cars behind were not hurt at all. The Eastern cars were also provided with the Westinghouse brake (which New England newspapers insist on calling the Westing*haus* brake), the Maine Central cars not. It is not probable that the train could have been brought to an absolute stop with any brake, as the engineman did not discover the danger until he was within two hundred feet of the switch; but as it was he could hardly call brakes before the collision, and probably not a brake was touched on the train until after the crash; whereas, with power brakes the speed of the train would have been reduced, and even that very likely would have saved all the slaughter and mangling and left no more serious results than a wrecked caboose car and a damaged locomotive. We think a careful study of the accidents we report monthly will indicate that these and similar inventions are having a great effect in diminishing the mortality of casualties. The list of accidents is a shocking one, and there are a great many of the most serious nature—such as collisions and derailments at high speed; yet in comparatively few of them are many persons injured. If there is any one thing more wonderful than the number and serious character of the railroad accidents it is the smallness of the number of the killed and wounded. Trains running at full speed meet each other, or run upon some obstacle; there seems scarcely a possibility that more than half the passengers should escape; yet in very many of these cases—most of them, perhaps, we may say—no one is hurt—and the only loss reported is of rolling stock. It is not the best thing to render accidents innocuous; the great aim should be to have no accidents: still the former is worthy of great efforts and liberal expenditures.

Every one must feel that it is especially unfortunate that the Eastern Railroad should have such a misfortune at such a time. Whatever faults of management the company may have been guilty of (in common with most other New England railroads) before the Revere accident, since that disaster it has been eminent in its efforts for reform and improvement. It has adopted many of the costliest and most approved improvements, made changes in management looking to greater vigilance and security, provided at no small expense against overcrowding and the consequent irregularity, and seemed willing to incur any expense necessary to insure greater safety. Such a disaster as this following such praiseworthy effort seems discouraging, and may have some effect in dissuading its laggard neighbors from following in its footsteps.

From New York to Philadelphia.

Experienced travelers very soon learn that it is much more comfortable to stay at home than to journey, either by land or water. To expatiate to such people on the pleasures of travel is, therefore, evidence of inexperience as conclusive as the acceptance of a bun just before dinner was of youthfulness to the "Autocrat of the Breakfast Table." Whether the annoyances which always attend travel are inherent in all methods of locomotion, or whether they are only the result of advancing years, when we lay aside the rose-colored glasses of youth through which we at first look at the world and life generally, and assume instead the spectacles of more mature age, we will not now stop to inquire. Let it suffice to say that home is synonymous with comfort, and "a stranger in a strange land" has, ever since the old Biblical times, been supposed to represent a person who is very uncomfortable indeed. That it will ever be possible to carry all the "home comforts" with us when we travel we are not sanguine enough to expect; but there are some annoyances so easily eradicated, and so irritating in their nature, that their toleration is inexcusable. One of these, of which there has been much and very just complaint, is the irrepressible vendor of all sorts of sundries, who attends most of our American railroad trains.

He seems to be ubiquitous, and from Maine to Mexico, and California to Cape Cod, he harasses weary travelers, who are as helpless in his hands as a patient in a dentist's chair. There is some excuse, perhaps, for his being tolerated in those sections of country in which the wants of civilization can only be supplied at places a long distance apart. We suppose there must be people who are unhappy when they travel unless they are supplied with such bodily sustenance as "pop corn" or "gum drops," or mental stimulant as the *Police Gazette* provides, or whose time hangs heavy on their hands unless they are entertained by thrilling narratives such as the "Red Ranger of the Red Rolling River," or similar touching romances. Of course it is hardly just that such people should be deprived of their own peculiar rational enjoyment; and if any patrician should dare to stay the flood of yellow-covered literature, we are quite sure they would rise in defense of their rights and unitedly and courageously would stuff all the ballot-boxes within their reach, in order to resist the encroachments of such "effete" ideas of exclusiveness. Rather than incur the danger of such a sanguinary revolution, we will not now insist that the supply of such low, brutal literature should be absolutely prohibited; but we do insist that no railroad company should permit those over whom they have control to thrust indelicate, if not indecent, pictures into the hands of all who travel in their cars. This annoyance has for a long time been tolerated on the Erie and other railroads. It is of course a difficult thing to prohibit the sale of any particular paper, and a railroad superintendent is very apt to find that his position will not be a bed of roses should he undertake to discriminate between the papers which should and those which should not be sold on his road. The thing of which we now complain is the unremitting importunity and the insolent way in which all sorts of things are thrust into the hands and to the attention of travelers.

It would seem that if there is any road on which there is no occasion whatever for the annoyance to which we refer, it is that between two cities so near each other as New York and Philadelphia. Nevertheless the train-boy is permitted on all trains between these two cities, and passengers are allowed only short intervals between each solicitation to buy his wares. A recent trip between these cities has given opportunity to notice the solicitations to which all in the train were subjected.

The first—of which there of course is no reason to complain—was the conductor's request to show tickets. The next was a distribution of an advertising bill announcing for sale "Five Years among the Indians," which purported to be the "personal narrative of the wife of Squatting Bear."

The other side of the bill announced "Thrilling Facts!! The Oneida Disaster! Price 25 cents." After a distribution of the bills, the vendor followed of course with his goods. The next offering was "The Political Sally Come Up," the purport of which was beyond our comprehension. This was followed by refreshment in the form of "the delicious and only genuine crystal maple caramels," which in about fifteen minutes were supplemented by "nice ripe bananas."

At Trenton a young man with a strong voice announced "nice fresh ham sandwiches, made expressly for this train." After leaving the capital of New Jersey, the same person proclaimed to passengers that he had "fried oysters put up expressly for this train, *nice and hot;* half-dozen oysters, pickles and crackers, all for 25 cents." After sufficient time was allowed to dispose of "half-dozen oysters" with the appurtenances, we were requested to buy "Philadelphia evening papers." As we approached the City of Brotherly Love one of the brethren proposed to "deliver baggage to any part of the city, hotels or private residences." In order to be sure that none might reach that hospitable place hungry, our tormentor passed through with a basket, and shouted "ripe apples" so loud that even the deaf might hear.

Perhaps there was cause to be grateful that we were spared the prize package business; neither were there any hard-boiled eggs nor fragrant peanuts sold; so our condition was not as uncomfortable as it might have been; but, to speak seriously, there is hardly any excuse for tolerating an annoyance so easy of remedy on a great line like the Pennsylvania road. It is, of course, almost impossible for those in authority to discriminate between what should and what should not be sold. On a journey so short as that from New York to Philadelphia, however, there is hardly anything which travelers feel the need of, excepting the daily papers, and even these need not be sold in the cars if they were offered for sale in the station in close proximity to the train.

The Vermont & Canada Meeting.

The Vermont & Canada shareholders to the number of about one hundred and fifty (including twenty or more ladies) met at St. Albans, Vt., October 17, to hold their annual meeting. Hon. Worthington C. Smith, the President, said that in view of the recent full report of the trustees of the Vermont Central and the Vermont & Canada, the board of the latter thought it unnecessary to make any report. He stated the liabilities of the company at $2,800,000, and the available assets at $1,300,000. The difference he said was more than balanced by the value of the Swanton Branch, the Stanstead, Shefford & Chambly bonds, and the increased value of the road in its improved condition. He thought they would be satisfied that their security was ample; but as their road was leased to the Vermont Central "its present prosperity is dependent upon the relief of the trustees from the embarrass

ment into which they have been temporarily driven by the combined assaults of rival interests at a period of stringency." He hoped the Vermont & Canada shareholders would take as much as possible of the new 8 per cent. equipment loan offered by the trustees. A ticket for directors, made up at an informal meeting of stockholders in Boston on the day the Vermont Central trustees made their report, was presented. It had the names of three of the old board—Worthington C. Smith, President, John Porter, Vice-President, and Benjamin P. Cheney—and four new names—Francis A. Brooks, William T. Hart, William Mixter, and James R. Nichols. There was some discussion and inquiry as to whether the proposed board were interested more in the Vermont & Canada, or in the Vermont Central, the lessee, one man saying that "in view of the fact that the Vermont & Canada is under obligation for more than $7,000,000, whereas it was once but $1,350,000, he thought the old board needed a little leavening." It was explained that for three millions of the seven the Vermont & Canada is liable only for the interest. Mr. Francis A. Brooks, one of the candidates for director, made a speech in which he said that he was satisfied that the improvements on the property made it better worth three millions now than thirteen hundred thousand when that was the amount of the liabilities. The present liabilities above three millions were a second liability for a million of equipment bonds and for the rent of the Ogdensburg & Lake Champlain Railroad. The latter was leased principally by reason of the danger that a road would be built connecting it with the Rutland road at Burlington, and thus give the latter and deprive the Vermont & Canada of its western traffic, and submit the latter to a dangerous competition. "He was satisfied the managers had acted prudently, and as for their honesty, it was not doubted. The more he had seen of them the better he was satisfied they ought to be sustained."

The proposed new board was chosen by an almost unanimous vote, there being 9,821 shares represented, and the lowest vote for any (Messrs. Smith and Cheney) being 9,442.

One speaker justified the leases because otherwise the leased lines would have been taken by rival New York interests. The management of the Vermont roads had caused prosperity in Boston trade and enhancement of the value of Boston real estate. Hereupon a stockholder said that if all this had been done for Boston, Boston should pay for it.

There was some discussion as to the liability of the Vermont Central in case it should fail to pay its rent, one understanding that the lessor might take possession of the lessee's property on paying the latter's debts; one of the new directors saying that it might enter into possession of its own road without assuming the trust debts; the President saying that the lessor was secondarily liable for the trust debts, and the director denying this. One gentleman thought these questions could not be thoroughly understood at such a meeting, but should be left to the directors, who had been selected as capable of understanding and deciding them for the best interest of the stockholders.

The President, on the part of the retiring board, gave an account of the circumstances under which the liabilities had been increased; the first, to $2,000,000, being made in settlement of litigation to retire overdue rents; others, to the amount of a million, being issued for the construction of the Swanton and Burlington branches, which had been provided for in the lease. The guaranty of the equipment bonds for a million was given, after a valuation by experts, which placed the value of the Vermont Central property at four millions, and this the President believed to be a low valuation of the property as it stands.

Record of Track Increase.

This number of the RAILROAD GAZETTE gives information of the following new railroad construction:

Detroit & Bay City, extended from Oxford northward 16 miles to Lapeer, Mich. *Cairo & Vincennes*, extended 15 miles, making a total of 100 miles of track down. *Winona & St. Peter*, extended 9 miles to a point 85 miles west of New Ulm. *Muscatine Western*, extended for 3½ miles west of the Iowa River, making 30 miles west from Muscatine. *Dakota Southern*, completed from Sioux City northwestward to Elk Point, 20 miles. *Cayuga Lake*, completed from Cayuga, N. Y., south to Ithaca, 35 miles. *Mobile & Alabama Grand Trunk*, extended northward 24 miles to the Tombigbee River, opposite Jackson, Ala. *Missouri, Kansas & Texas*, extended from Atoka south by west 42 miles to Caddo, Ind. T.

This is a total of 164½ miles of new railroad.

THE HORSE DISEASE has led the city fathers of New York to an act which is very like locking the stable door after the horse is stolen. They have voted that "dummy" steam engines be permitted on the streets and street railroads for the period of thirty days, beginning with October 29. These gentlemen seem to think that people have built and stored away a stock of street engines which it is unlawful to use in anticipation of the general sickness of horses and the consequent gracious permission of the city government to use steam. There is the same obstacle to the temporary use of dummies that there is to the use of flying machines—we haven't got them, can't get them within thirty days, and wouldn't get them if we could for only thirty days' use. We notice that the proprietor of the East New York & Canarsie Railroad has offered the use of one of his locomotives and suitable cars for use on a Brooklyn street railroad; but his rolling stock was made for a *railroad*, not a *tram* road, and the locomotive is heavier than would be convenient for street use. It is a pity that there are not available a dozen or more engines designed expressly for street railroads and adapted for such service. There would be an admirable opportunity for testing them, when the value of their service would be universally recognized and the general prejudice against steam in the streets (which is probably the greatest obstacle to its common use) would be disarmed. It is not impossible that their common use for three or four weeks would so demonstrate their value and convenience that they would never be disused thereafter. Once give the hundreds of thousands of New Yorkers who ride daily to and from their homes packed in street cars like herrings in a box cars enough to provide all with seats—which we believe might be done economically were the motive power used sufficient to draw, on occasion, two or three cars instead of one—and it would be almost impossible to return to the old system. We hope that at least a few dummies may be found and used on some of the more crowded routes. If they should be found imperfect or inconvenient, their use might at least indicate what improvements are needed to fit them for street service.

MR. F. R. FIRTH, the young Chief Engineer and Superintendent of the Atchison & Nebraska Railroad, who met his death last spring by an accident on his road, seems to have impressed all who met him as a man of extraordinary promise and noble character. It will be remembered that he was the son of Mr. Abraham Firth, of Boston, until very recently Superintendent of the Eastern Division of the Boston & Albany Railroad. It was intended that the remains of young Mr. Firth should be removed to Massachusetts for burial, his parents and family residing there. To manifest their appreciation of the character of the deceased, the employees who had served under him on the Atchison & Nebraska Railroad, 364 in number, united in a subscription, amounting to $911.25, to be applied to the erection of a monument over his grave. On remitting this sum to Mr. Abraham Firth, that gentleman, in acknowledging it, replied:

"You send me the gift without conditions as to where the monument shall be erected; but you evidently expected it would be in his native State. It was the original purpose of his family to have removed his body here in due time; but the unbounded love and honor shown his memory by the people of Atchison has led us to hesitate, and now your grand act has reversed our first decision.

"Both his grave and monument will be at Atchison, where his work as a man was chiefly done."

This seems eminently fitting, and creditable alike to all concerned. Doubtless it is a sacrifice for the family to leave the grave of the young man fifteen hundred miles away; but there, where he did his work and earned his honors and won the respect of an entire community, his monument will be a constant reminder of his character and a perpetual incitement to an imitation of his noble life.

THE LAKE MARINE has had a remarkably profitable season this year, owing to a combination of causes. There has been an enormous crop of grain to move; the burning of Chicago has increased materially the demand for lumber; and the great demand for and high price of iron ore has occasioned unusually large shipments from Lake Superior at unusually high rates. While there has been full employment for all vessels, the rates have been exceptionally high—higher than for many years. For instance, almost every year for a time in the summer corn is carried from Chicago to Buffalo for three cents a bushel. This year scarcely any has been taken for less than seven cents, little as low, and for some time rates have been much higher, reaching fifteen cents. Profits in many cases have been enormous, some vessels having earned two-thirds of their cost since navigation opened. That the higher price is caused by an increase in the demand and not by a decrease in the supply is proved sufficiently by the fact that the tonnage of arrivals and departures has been larger than ever before. Still there has not been very recently a very rapid increase in the lake marine, profits having been moderate for a few years past. But the great profits of the current year have stimulated shipbuilding wonderfully, and there are now more new vessels on the stocks than ever before probably.

RUSSIA has become a customer for American locomotives. Mr. M. Baird, of the Baldwin Locomotive Works, has just returned from Russia much benfited by his journey. He brought with him a contract for nine engines for the Hango Railway, of Finland. These are to be of 5-feet gauge, of the ordinary American pattern, with 15x25-inch cylinders, 62-inch driving wheels, and to burn wood.

Ten of the engines for Russia have been shipped, and have arrived in that country, and are now being erected by the agent of the works, Mr. Frank K. Hain, and their engineer, Mr. H. E. Kinzer.

THE RAILROAD CONDUCTOR'S ASSOCIATION held its annual convention in Louisville last week, and chose as officers for the ensuing year James Marshall, of the New York Central & Hudson River Railroad, President; James G. Cormack, of the Illinois Central, and M. S. Joy, of the Memphis & Charleston, Vice-Presidents; John W. Moore, Isaac N. Homer and Edward Morrell, Executive Committee; James Y. Culbertson, Secretary and Treasurer. The next convention is to be held in Boston, on the third Wednesday of October, 1873.

STEEL RAILS, we are informed, were used exclusively in the track of the Lehigh & Susquehanna Railroad when it was first constructed, a few years ago. We had supposed that their first use in new track in this country—for any considerable distance—would be on the Chesapeake & Ohio Railroad, which is said to be putting down steel on a considerable section, which extends between the coal mines and the beds of iron ore.

THE AMERICAN SOCIETY OF CIVIL ENGINEERS will hold its annual meeting at the rooms, No. 63 William street, November 6 at 10 a. m. A paper by Mr. T. Guilford Smith, on English Coal Mining Machinery, will probably be read at this session, and also one by Mr. Louis Nickerson, of St. Louis.

A CHEMICAL ANALYSIS of waters used in locomotive boilers we spoke of recently as something very desirable, but hitherto, so far as we knew, neglected by all our railroad companies. We now learn that the Pennsylvania Railroad Company has recently been collecting samples of water from all its water tanks, to be analyzed by a competent chemist.

NEW PUBLICATIONS.

Van Nostrand's Eclectic Engineering Magazine.—The original papers in the March number of this periodical are, "Uniform Cross-Section and T Abutments: their Proper Proportions and Sizes, Deduced from Rankine's General Formula of Earth Pressure," which is by William Cain, C. E.; "Permanent and Temporary Structures," in which the writer protests against iron structures being called permanent because they are iron, gives his opinion that light iron trusses generally will not have a very long life, and that "the only true form for a *permanent* iron bridge is the plate, or tubular girder;" the third original paper is "Petroleum," in which is an interesting dicussion of the transportation of crude petroleum in pipes, and a chapter (and a very satisfactory one) on the use of crude petroleum or crude oil as fuel. One or both of these we hope to reproduce. There is the usual abundance of selected articles, mostly from foreign journals, *Engineer* being credited with eight, *The Engineer* with five, *The Builder* with four, the *Mechanic's Magazine* with two *Nature*, *Zeitschrift der Deutsche Ingenieure*, *Journal of Applied Chemistry*, *The Architect*, *Annales des Mines*, *Journal of the Society of Arts*, *American Journal of Science and Arts* each with one, and a number being papers read before engineering and scientific societies, on a great variety of subjects interest ing to engineers.

Railroad Directors and Railroad Supplies.

A recent number of *Engineering* contains the following letter from a correspondent who signs himself "Behind the Scenes," and who, we are sorry to say, might easily have made similar observations "behind the scenes" on too many American railroads: we had hoped such practices were confined to this country, but as it seems they are not, we have the melancholy satisfaction of feeling that some of our neighbors are as bad as ourselves:

The conduct of railway directors having been brought into prominent notice by the recent *expose* of affairs in the case of the Metropolitan Railway, one feature of which was justly dealt with in an article in *Engineering* of the 20th inst., it seems to me a fitting opportunity for directing attention to a crying evil in railway direction which it would be well for shareholders to realize, and, having done so, to set a determined face against it.

I refer to the practice of railway directors being also directors of, or partners in, establishments that supply railway material.

A large number of directors are more or less involved in this way, and, for the most part (there are, of course, honorable exceptions), think nothing of using every effort to throw the orders of the railway companies into the hands of the establishments they happen to be connected with.

The consequence is the Locomotive or Resident Engineer of a railway, who is, of course, held wholly responsible when anything goes wrong—a director, it would seem, like a king or queen, "can do no wrong"—finds at almost every turn that his hands are weakened in dealing with the manufacturers, and often he is compelled to use inferior articles or run the risk of offending one or more of his directors.

The trying part of it is, that these said directors are his employers, on whom he is dependent not only for his income for the time being, but also for his character, which is the measure of his income for all time, should he be forced to leave them; but which—as would appear from the recent conduct of the Metropolitan directors toward their Engineer—some boards, at all events, treat as of little consequence, provided they themselves, to use a homely expression, "come off with whole skins."

It is bad in every way that such important departments as are the engineering departments of a railway, involving, as they do, the lives and limbs of thousands of human beings, should be fettered by influences which, putting out of consideration the question of life and death, cannot fail, to say the least, to result in pecuniary loss to the shareholders.

Directors who are influenced by these contending interests seem to see nothing wrong in putting money into their own pockets by directing orders into the particular channels they are interested in, while they would be the first to expose and condemn (and I think very properly so) an official were he found to be exerting his influence in placing orders with establishments in which he had pecuniary interests. Such practices, whether by director or by officials, are inconsistent with strict integrity and honorable dealing.

Shareholders would do wisely to enforce, with the greatest stringency, a rule such as that which Parliament in its wisdom has established for its own guidance—a rule which debars any one from sitting as a Member of Parliament who is a partner in, or similarly connected with, any house of business supplying material to the government. This rule is no dead letter. Very recently, it will be remembered, a case occurred in which a member, who had been duly returned, was unseated because he was a partner (though only a "sleeping" one), in a concern that held a government contract.

My remarks are not based on fancy, but are dictated by actual experience. I have known of cases in which, for example, one director was partner in a cement manufactory. As long as the orders of the railway company went his way, all was smooth and satisfactory, but whenever they went elsewhere, owing to the price being lower or the cement better, the Engineer was sure to hear of it, either verbally or through the Secretary, who wrote that Mr. ——— begged to know why the consumption of cement had fallen off of late. A delicate hint to redirect the orders.

Another director was interested in the supply of rolling stock. Orders went to his establishment when, to say the least, it would have been in the interests of the railway for them to have gone to firms of more experience and under better management. Besides the fact that the establishment had a "friend at court," did not, as may be imagined, smooth the difficulties in the way of the Engineer enforcing strict compliance with the specifications. Moreover, whenever the Engineer held back a balance to cover what remained to be done by the manufacturers to complete the orders, down came a letter from the Secretary to say that Mr. ——— wished to know why the balance was not paid, and that he hoped no time would be lost in doing so.

Another director took special interest in the supply of fuel. He had a brother, who, like a bad penny, constantly turned up, and by all kinds of dodges, endeavored to thrust himself between the coal-owners and the company. This he was enabled to do by the facility he had through his brother, the director, of finding out the kind of fuel the company were trying and

where it came from. Off he ran post haste to the colliery, where, as brother to a director, he represented that he was the sole medium through which fuel for the railway passed. His next step was to visit the Engineer, and to inform him that he had been so fortunate as to secure the sole agency of Messrs. —— for the —— district. That being so, "it would facilitate business greatly if all orders were transmitted to the colliery through him." His relationship to a director obtained for him a hearing and a credence which might otherwise have been denied him; and although the orders were not placed as he proposed, he obtained further information about the fuel, which enabled him to impose with still greater effect on the coal-owners. This resulted in their agreeing to pay him a commission on the fuel supplied. Of course this extra charge could not fail in the ordinary course of things to come out of the pocket of the railway company. But ere very long the Engineer and the managing partner happened to meet, and on comparing notes the above facts leaked out. A new contract being entered into, the commission was struck off, whereupon the would-be agent reported the circumstance to his brother, the director. Will you be surprised to learn that the director scrupled not to tell the Engineer to let the managing partner understand that "unless he conceded to his brother's terms he must expect the orders to go elsewhere?" The Engineer conveyed the message, but added that no notice was to be taken of it, as the brother had not the shadow of a title to commission.

Instances of this kind might be multiplied, but I think I have said enough to show the nature and degree of influence that directors bring to bear on such matters. The remarkable thing is that these transactions are by individuals who claim to be, and are, I believe, regarded as upright and honorable men.

Be that as it may, it results in one of two things. If the Engineer be deficient in moral courage, he yields, and becomes party to a system that not only degrades himself and all concerned, but ends in loss, if not in grave disaster, to the company. On the other hand, if he have moral courage to oppose it, he finds perchance, at a crisis such as has just befallen the Metropolitan Company, that he has "made no friends," and is sent about his business. Thankful, indeed, may he be if his services are not dispensed with, after, it may be, years of faithful service, in a way calculated to do him permanent injury.

The Condition of the Atlantic & Great Western.

Mr. James McHenry has issued a circular, unofficially, in advance of the annual report, in which after premising that the road came into the hands of the new administration September 1, 1872, with insufficient and imperfect equipment, depreciated road, and traffic diverted, and after quoting from a Cincinnati paper the improvements made in the property during the year, he says:

In preparation for the annual report, an independent committee was appointed by the directors to investigate thoroughly into the following points:

"1. The cash account, including receipts from all sources, separating capital from revenue.

"2. The supply account, including particulars of all supplies purchased since the reorganization, with quantities, prices, and from whom purchased, and total of amounts and materials.

"3. The construction account, showing actual cost for labor and materials, and particulars of new materials purchased and old materials sold.

"4. The position, quantity, quality and condition of the rolling stock, with explanation when possible why the Atlantic & Great Western rolling stock earnings, per engine, per carriage and per car run so much under the earnings of the rolling stock of other and competing lines.

"5. Particulars of all freight carried, the destination and the rates per mile, and the same with reference to all passenger traffic, and the total freight and passenger traffic.

"6. General condition of the permanent way.

"7. The statements and accounts for goods and passengers, and finally, such advice as to the administration of the road as experience may suggest, especially with reference to the coal and petroleum traffic."

The committee's attention was also called to the necessity of a separation of the gross and net earnings of each description of traffic, with a view to show clearly the disastrous effects on the net revenues of the present vicious system almost universal in America of conducting the freight and passenger business, whereby railroads receive 70 per cent. or less of the amounts actually paid by the public, whereas if the public had the advantage of this reduction the business would be increased. A vast undeveloped traffic unquestionably exists, now smothered by capricious or badly adjusted tariffs, framed rather to "corner" shippers than to aid their operations. As at present conducted in the United States—under the system of numerous passenger agencies and rolling stock companies, paid extravagantly for the use of carriages (which should be provided by the railways) to carry passengers with free passes (in America graphically called "dead-heads")—the passenger traffic is so corrupt and unprofitable, that if not vigorously and radically reformed it had better be altogether abandoned.

The statistics of the leading American railroads which accompany this circular show that the Atlantic & Great Western has a full average business in passengers and goods, and a fair average supply of rolling stock, but the figures also develop the fact that the traffic has apparently produced 40 per cent. less than the average of same traffic on other lines; the rates being the same and the rolling stock making full mileage. The earnings of the Atlantic & Great Western for the year just closed have been published monthly. The receipts are actually less than seven years ago—the only instance of the receipts of an American railroad decreasing instead of largely augmenting. This result is due to the misconduct of previous administrations. The returns now coming forward show satisfactory increases arising from the improved state of the line, the improved credit of the company, the increase of rolling stock, and the ability of the management.

By means of the United States Rolling-Stock Company, an enormous addition to the rolling stock has been assured, but the delay in the delivery, already fully explained in the report of that company, published in July, has prevented the railway from deriving much benefit from the supply. Up to September 1, the Rolling-Stock Company had been enabled to secure deliveries of only one-third of the quantity contracted for, and consequently less than £200,000 out of the £500,000 paid-up capital have yet been invested. A large portion having been rented to other companies, the Atlantic & Great Western has had the advantage, and only in the latter months of the year, of the use of the new rolling stock to the extent only of about one-fifth of what was expected.

Though it is unlikely that there will be funds in hand this year for the interest on the third-mortgage bonds, yet the prospects are very promising for a considerable dividend next year, in reference to which matter the report will, no doubt, give full details. I have not the slightest doubt that the estimates of the General Manager, when making his requisitions for more capital and for new rolling stock will be fully justified by the result, and that in another year the interest on the third-mortgage bonds will be fully covered.

An agreement for the lease of the Cleveland & Mahoning, the Niles & New Lisbon, and the Liberty & Vienna roads was entered into in December, 1871, in order to hold these lines permanently in the system of the Atlantic & Great Western, and to secure the large traffic being developed in the coal district through which they run. It was not, however, until August 7, 1872, that all legal and other formalities required for the consolidation of the three companies and for their formal transfer to the Atlantic & Great Western were completed. By the operation of a sinking fund these railroads will ultimately be absorbed by the Atlantic & Great Western, but in the meantime the board of directors is entirely separate, the chief duty of the Mahoning board being to enforce the terms of the lease against the Atlantic & Great Western Company by collecting the rental and remitting monthly to the trustees of the leased lines rental bonds, which were issued to complete the purchase, and which form a first charge or mortgage on the Cleveland & Mahoning Valley Railway, by which name the consolidated lines are called. The rental is regularly remitted to London, and the profit to the Atlantic & Great Western over and above the rental is very large.

Early Opposition to Railroads.

The principal parties who took an active part in opposition to the London & Birmingham Railway were Lady Bridgewater and her trustees, Lord Essex and Sir Astley Cooper, who, with the Grand Junction Canal Company, formed a powerful confederacy against the bill. By their influence the landowners throughout the counties of Hertford and Buckingham organized themselves to oppose the measure. The time for preparing the plans to be deposited with the several clerks of the peace, as required by the standing orders of Parliament, being very limited, the necessary documents were prepared in great haste, and were deposited in such an imperfect state as to give just grounds for presuming that they would not pass the ordeal of the Standing Orders Committee. It was also thought that alterations might be made in some parts of the railway which would remove the objections of the principal landowners, and it was, therefore, determined to postpone the application to Parliament until the following session.

In the meantime the opponents of the bill out of doors were not idle. Numerous pamphlets were published calling on the public to "beware of the bubbles," and holding up the promoters of railways to ridicule. The canal proprietors, landowners and road trustees made common cause in decrying and opposing the project. The failure of railways was confidently predicted; indeed, it was elaborately attempted to be proved that they had failed. It was said that "long before any new lines can be constructed inland navigation will be so much improved, and steam-carriages will be on the turnpike roads in such numbers, that railway companies will become bankrupt." It was also industriously spread abroad that the locomotive engines, having been found useless and highly dangerous on the Liverpool & Manchester line, were immediately to be abandoned in favor of horses—a rumor which the directors of the company considered it necessary publicly to contradict.

Public meetings were held in all the counties through which the line would pass between London and Birmingham, at which the project was denounced, and strong resolutions passed against it. The celebrated surgeon, Sir Astley Cooper, was one of the strongest opponents of the bill. He was quite inflexible in his opposition. No deviation or improvement that could be suggested had the slightest effect in conciliating him. He was opposed to railways generally and to this in particular. "Your scheme," said he, "is preposterous in the extreme. It is of so extravagant a character as to be positively absurd. Then look at the recklessness of your proceedings. You are proposing to cut up our estates in all directions for the purpose of making unnecessary roads. Do you think for one moment of the destruction of property involved by it?" Such being the opposition of the owners of land, it was with the greatest difficulty that an accurate survey of the line could be made. At one point the vigilance of the landowners and their servants was such that the surveyors were effectually prevented taking the levels by the light of day, and it was only at length accomplished at night by means of dark lanterns. There was one clergyman who made such alarming demonstrations of his opposition, that the extraordinary expedient was resorted to of surveying his property during the time he was engaged in the pulpit. This was managed by having a strong force of surveyors in readiness to commence their operations, who entered the clergyman's grounds on one side, the moment they saw him fairly off them on the other. By a well-organized and systematic arrangement, each man concluded his allotted task just as the reverend gentleman concluded his sermon, so that before he left the church the deed was done and the sinners had all decamped. Notwithstanding all opposition, the staff of surveyors, under the direction of Mr. Gooch, succeeded in completing the survey; and by the end of 1831 the requisite plans were deposited preparatory to an application being made to Parliament in the ensuing session.—*Railway Service Gazette.*

British Rail Exports.

Heyerdahl, Schönberg & Co. give the following tabular statement of exports of rails from Great Britain during September, extracted from Government returns:

To	Month end'g Sept. 30			Nine mos. ending Sept. 30.		
	1870 Tons.	1871. Tons.	1872. Tons.	1870. Tons.	1871. Tons.	1872. Tons.
United States	33,79:	54,378	37,732	313,410	389,535	378,053
Russia	30,1 9	3'764	24,646	193,809	69,398	73,587
Austrian Territo's.	6,709	3,350	....	32,917	18 591	7,534
British India	9,389	1,595	589	132,187	39,82?	10,798
British North Am.	4,91!	8,565	9,689	29,912	56.709	68,739
Egypt	448	723	1,495	2.014	3.152	11,888
Australia	1,358	225	2,55:	7,381	11.60:	17,134
Brazil	216	903	2,31!	2.951	15,419	15.745
Holland	518	445	17:	14,9 0	9.044	2 869
Spain and Canaries	481	2,157	511	9.944	8,668	8,868
Sweden	1,001	723	1,642	2,121	7.308	9,861
Chili	2,532	2,421	19	12,9:0	10.324	2,609
Span. W. I. Islands	22	54	20	3.188	2.26	1,109
Peru	1,768	2,144	1,074	13 33:	18,493	25,774
France	94	4	150	342	1,716	457
Germany	1,86:	3.527	4,117	44,?12	44,149	32,642
Other countries....	8,737	7,9:2	6,666	46,559	59,403	53,283
Total	103,985	93,529	93,383	862,218	756 370	729,9.0
Total exports from Gr. Brit. of iron & steel to all c'ntr's.	250,044	309,743	300,508	2,212,475	2,381,916	2,602,883

There is very little change, it will be noticed, in the total exports, either for the month or the nine months, and the shipments to the United States are but 3 per cent. less for the nine months, though 30 per cent. for September.

Railroad Manufactures.

The rail mill connected with the Pennsylvania Iron Works, of Danville, recently turned out, in about ten hours, 126 tons of finished railroad iron, the whole number of bars being 504, 30 feet long, and weighing 56 pounds per yard. This was achieved by one set of men and one set of rolls.

The Harrisburg Car Manufacturing Company is turning out ten freight cars per day.

New Mail Route.

The Post Office Department has ordered mail service on the new Paris & Danville Railroad, from Paris to Danville, Ill., 36 miles, beginning November 1.

General Railroad News.

ELECTIONS AND APPOINTMENTS.

—Judge Daniel R. Magruder has been re-elected President of the Annapolis & Elkridge Railroad Company.

—A compromise between the two opposing boards of directors of the Springfield & Northwestern Railroad Company has been made and a new board formed, composed of members of both the rival boards. The new directors are: Joel Dalby, of Sangamon County; W. G. Green and Jno. K. Kincaid, Menard County: Hugh Fullerton, Lyman Lacy and Robt. S. Moore, Mason County; W. Selden Gale, Knox County; S. P. Shope and D. J. Waggoner, Fulton County, Ill. The officers are: President, W. G. Green; Vice-President, Hugh Fullerton; Treasurer, John Williams; Secretary, G. H. Blanchard; Engineer, W. J. Ott; Attorney, S. P. Shope.

—Mr. H. F. Sweetzer has resigned his position as General Manager of the Atlantic & Great Western Railroad. Mr. C. W. Bradley has also resigned the position of Superintendent of the First and Second Divisions, and Mr. C.W. Winslow retires from his post as Auditor. These vacancies have been filled by the appointment of Mr. J. D. Barton, General Superintendent; Mr. A. L. Dunbar, Acting Superintendent of the First and Second Divisions; and Earl Tupper, Auditor. Mr. R. B. Brown is also appointed Purchasing Agent. Mr. Barton was formerly Superintendent of the Long Island Railroad, and has been, since last spring, Superintendent of the United States Rolling Stock Company. Messrs. Dunbar, Tupper and Brown have been for some time in the employ of the Atlantic & Great Western Company.

—At the annual meeting of the stockholders of the Kennebec & Wiscasset Railroad Company, at Wiscasset, Me., October 21, the following directors were chosen: Henry Ingalls, R. H. Tucker, Andrew Lacy, Isaac T. Hobson, Alfred Lennox, Richard T. Rundlett, William S. Tilton, leaving six vacancies to be filled by the board.

—At the annual meeting of the Charlotte, Columbia & Augusta Railroad Company, at Columbia, S. C., October 22, Colonel John B. Palmer, of Columbia, S. C., was chosen President of the company, and Messrs. John B. Palmer, A. B. Davidson, J. H. Rion, W. R. Robertson, J. H. McMaster, H. Robertson and B. D. Hansard, of South Carolina; Josiah Sibley, John J. Cohen, S. D. Heard and H. B. Plant, of Georgia; Wm. Johnston, R. R. Bridgers and J. W. Thompson, of North Carolina; B. F. Newcomer and W. T. Walters, of Baltimore, Md.; A. S. Buford, of Virginia, and M. K. Jesup, of New York City, were chosen directors. Of these, Messrs. H. Robertson, Hansard, Plant, Bridgers, Thompson, Buford and Jesup, some of whom, at least, are interested in the Southern Railway Security Company, are new members of the board, succeeding Messrs. Wilson, Springs and Barringer, of North Carolina; McLure, Stanley and T. J. Robertson, of South Carolina, and Jackson, of Georgia, the remainder of the old board being re-elected. Colonel Palmer succeeds Mr. Wm. Johnston as President, Mr. Johnston remaining in the board of directors. The number of shares represented and voted upon was 18,248.

—The Grand International Division of the Brotherhood of Locomotive Engineers, whose session has just ended, at St. Louis, Mo., re-elected Mr. Charles Wilson Grand Chief Engineer. Mr. T. S. Ingraham, of Lafayette, Ind., was chosen First Grand Assistant Engineer, and Mr. Robert Pearson, of Toronto, Can., Second Grand Assistant Engineer.

—The Railroad Conductors' Life Insurance Association, whose annual meeting was held at Louisville, Ky., chose the following officers for the ensuing year: James Marshall, Hudson River Railroad, President; James G. Cormack, Illinois Central, First Vice-President; M. S. Joy, Memphis & Charleston Railroad, Second Vice-President; John W. Moore, Isaac N. Homer and Edward Morrell, Executive Committee; James F. Culbertson, Secretary and Treasurer.

—A circular issued from the office of the President of the St. Louis & Southeastern Railway Company, in St. Louis, announces the following official appointments by the consolidated company: Charles W. Gardner, Secretary and Treasurer; John P. Haines, Auditor; Phelps Sasseen, Assistant Auditor; John W. Mass, General Freight Agent; W. B. Davenport, General Ticket Agent; J. F. Boyd, General Superintendent; George S. Winslow, Superintendent St. Louis Division; W. T. Jacoby, Superintendent Nashville Division; David Jones, Engineer; L. B. Salisbury, Master Mechanic St. Louis Division; H. M Smith, Master Mechanic Nashville Division; H. W. Gardiner, Paymaster; Theo. Stickney, Supply Agent; J. M. Hamill, Attorney St. Louis Division, W. L. Gordon, Attorney Nashville Division; and Thomas L. Beal, Baggage-master.

—At a meeting of the stockholders of the St. Louis & Southeastern Railway Company (consolidated), held at Evansville, Ind., October 22, the following gentlemen were chosen directors for the ensuing year: William Heilman, John A. Reitz, Samuel Bayard and Thomas E. Garvin, of Evansville, Ind.; S. B. Vance and Jackson McBlain, of Henderson, Ky.; W. L. Gordon, of Madisonville, Ky.; Joseph J. Castles, of Equality, Ill.; Jedish F. Alexander, of Greenville, Ill.; Major Bluford Wilson, of Shawneetown, Ill.; Major Charles W. Gardiner and Gen. Edward F. Winslow, of St. Louis, Mo.; and General James H. Wilson, of New York City. An election of officers will be held in a short time, of which due notice will be given.

—Mr. F. C. Petrie has been appointed Master Mechanic of the Smoky Hill Division of the Kansas Pacific Railway, in place of Mr. A. Jackson, who has resigned. His headquarters will be at Ellis, Kansas. Mr. Charles Case has been appointed foreman of the shops, in place of Mr. Petrie, appointed Master Mechanic.

—At the annual meeting of the stockholders of the Grand River Valley Railroad Company, held at Jackson, Mich., Amos Root, M. A. McNaughton and W. H. Withington, of Jackson, Mich., E. S. Lacey and E. W. Barber, of Charlotte, Mich., N. Barlow, of Hastings, Mich., and Henry A. Sloane, of Eaton Rapids, Mich., were elected directors. The board elected Amos Root, President, E. S. Lacey, Treasurer, and E. W. Barber Secretary. They are all re-elections. The road is leased and operated by the Michigan Central Company.

—The board of directors of the New Haven, Middletown & Willimantic (better known as the Connecticut Air Line) Railroad Company, at a meeting held at Middletown, Conn., last week, re-elected Julius Hotchkiss President, John M. Douglas Vice-President, Robert G. Pike Secretary, and A. M. Colgrove Treasurer.

—Hon. William H. Barnum, President of the Connecticut Western Railroad Company, was seriously injured, in the Grand Central Depot in New York, a few days since, by the falling of the smoke-stack of a locomotive upon him.

—At the annual meeting of the Great Western Railway Company of Canada, at London, on the 16th of October, the retiring directors, Sir Thomas Dakin, Mr. Gilson Homan and Mr. John Cleghorn, all of London, received nearly 72,000 votes each, against 43,000 for an opposition ticket led by Mr. John Fidler, who has recently been making charges against the management. John Young and Sidney Smith, of London, and Samuel Sprenll, of Toronto, were re-elected auditors.

—At the annual meeting of the Delhi & Middletown Railroad Company, held in Delhi, N. Y., October 8, the following board of directors was elected: Thomas Cornell, G. E. Marvine, Charles Marvine, Charles Hathaway, Seth H. White, James H. Graham, Alex. Storie, Richard Morse, J. K. Hood, W. B. Shafer,

W. W. Grant, Lemuel Sines, W. C. Sheldon. The following officers were re-elected: G. E. Marvine, President; Thomas Cornell, Vice-President; S. H. White Secretary; W. W. Grant, Treasurer; J. P. Gould, Engineer.

—Mr. A. W. Quackenbush, Master Mechanic of the New York, Kingston & Syracuse Railroad, was recently presented with a valuable set of mathematical instruments by the employees of the road.

TRAFFIC AND EARNINGS.

—The earnings of the Hannibal & St. Joseph Railroad for the fiscal year ending August 31 were: 1871, $3,066,731.39; 1872, $2,484,670.53; decrease, $582,060.86, or 19 per cent. This large decrease is due, doubtless, to a combination of causes, with which the change of management may have little to do. A break with the Chicago, Burlington & Quincy would doubtless prove unfortunate to the road, but the relations of the two roads have continued intimate, though the Burlington Company will probably soon be prepared to enter the Hannibal & St. Joseph's field with its own lines at several points by short routes. But the decrease during the past year is due chiefly to a decrease in the through business to Kansas, which, in the aggregate, was probably much less than during the two years previous, and to the completion of two new lines to compete for the traffic which before the Hannibal & St. Joseph had pretty much to itself.

—The earnings of the St. Louis & Southeastern Railway (consolidated) for the third week in October were $28,200, being an increase of $2,500 over the corresponding week in September.

—The earnings of the St. Louis & Iron Mountain Railroad for the second week in October were: 1872, $52,882; 1871, $40,425; increase, $12,457, or 30¾ per cent.

—The following returns of most of the leading railroads of the Dominion of Canada are for the month of August:

	Total 1872.	Total 1871.	Miles 1872.	Miles 1871.
Great Western	$381.319	$361.834	351½	351½
Grand Trunk	693,0 5	677,213	1,377	1,377
London & Port Stanley	8,671	7,586	24½	24½
Welland	12,935	15.166	25	25
Northern	83 214	61.62-	97	97
Midland of Canada	40.743	40,119	56	56
S. Lawrence & Ottawa	14,081	12,453	54	54
European & North American	30.789	30.567	108	108
Nova Scotia	37,723	33,994	145	145
Total	$1,302,340	$1,240,514	2,238	2,238

This is at the rate of $226 per mile in 1872 and $554 in 1871.

—The earnings of the Marietta & Cincinnati Railroad for the third week in October were: 1872, $50,707; 1871, $42,415; increase, $8,291, or 19½ per cent.

—The receipts of the Toronto & Nipissing Railway are reported to be at the rate of $1,000 per day on 87 miles of road.

—The earnings of the Kansas Pacific Railway for the second week in October were: From passengers, $38,798.00; freight, $66,228.27; mails, $2,055.31; total, $107,081.58. Of this amount, $3,087.71 was for transportation of troops, mails and government freight.

—The earnings of the Great Western Railway of Canada for the week ending October 11 were: 1872, £28,252; 1871, £21,543; increase, £6,709, or 31¼ per cent.

—The earnings of the Grand Trunk Railway for the week ending October 12 were: 1872, £43,500; 1871, £38,500; increase, £5,000, or 13 per cent.

PERSONAL.

—Mr. William Bliss, recently appointed to the new office of General Manager of the Boston & Albany Railroad, has been for some years General Freight Agent of the road.

—Mr. W. B. Davenport, General Ticket Agent of the St. Louis & Southeastern Railway, was married at St. Louis, October 22, to Miss Lizzie Bacon, daughter of C. N. Bacon, of the Vandalia Line.

—Mr. Joseph W. Nesbitt, having resigned his position as Assistant Superintendent of the Evansville, Terre Haute & Chicago Railroad, in order to accept a position in California, the employees of his late road presented him with a valuable gold watch and chain at Terre Haute, October 19.

—Mr. William Swan, road-master of the Gilman, Clinton & Springfield Railroad, died at his residence in Clinton, Ill., October 24, after a short illness.

—Nathaniel Fullerton, at one time President of the Rutland & Burlington Railroad Company, died on the morning of the 29th, at his residence in Chester, Vt., aged 98 years.

THE SCRAP HEAP.

Electric Railroad Signals.

The Telegrapher says: "The adoption of some system of electric safety signaling has become a necessity, and, appreciating this fact, railroad managers are anxiously looking for the introduction of such a system. To secure general adoption and use the signal system must be simple, perfectly reliable, or as nearly so as any human device can be, and at the same time economical. The attention of inventors has been for some time past turned in this direction, and numerous devices have from time to time made their appearance, and those interested in them have claimed that the desired result had been reached. It is not too much to say that upon practical trial they have heretofore failed to justify these claims. Some of them have worked reasonably well for a short time, and then, for reasons which are obvious, have failed. The automatic signals have been vitally deficient in their methods of connecting the rails with the electric circuit controlling the working of the signals. It has been found by practical experience that no attachment, in the shape of levers or springs, can be made to rails which will permanently stand against the immense concussion of the trains as they pass rapidly over them. As a consequence, after a short time the signals cease to work, or work with so little certainty or reliability as to be worse than useless, and are eventually abandoned. Another objection to such signals has been the complicated machinery employed, and the number of wires and large amount of battery required to work them.

"To be reliable the signals should be simple, and as little liable to derangement as it is possible to make them. Instead of seeking, as apparently some inventors of electric railway signals have, to add to the complication of the machinery, the number of wires and amount of battery employed, simplicity of construction and economy of wires and battery should be sought.

* * * * * * * *

"For the last two years practical telegraph and mechanical skill and scientific ability have been combined in perfecting such a system, and it has been already sufficiently tested in practical use to demonstrate the correctness of the principles upon which it is based, and the adaptability of the machinery employed to produce satisfactory results. The inventions referred to are combined in the railway signal system which is now being introduced by Messrs. F. L. Pope & Co., the agents of the Electric Railway Signal Company, and which is covered by patents issued to Mr. Pope and Mr. S. C. Hendrickson. The automatic signals adapted for use upon double-track roads are connected directly to the rails, which themselves form a part of the electric circuit, thus obviating the necessity of any lever, spring or other attachment liable to be deranged by the use of the road.

"The combination of railway signals with the track as a part of the circuit, which is essential to permanence and reliability in operating automatic railway signals, is secured in patents recently issued to Mr. Pope in this country and Great Britain."

A Warning to Travelers.

As a train on the Erie Railway was approaching the bridge at West Paterson, a few days ago, a passenger on the train put his head out of one of the car-windows to look at some object which the train had just passed. Not seeing the bridge his head was struck and his skull smashed by one of the posts, and the body was drawn out through the car-window and dropped into the river below.

OLD AND NEW ROADS.

Cairo & Vincennes.

Mr. John Lee, Jr., Superintendent of Transportation, states, under date of October 24, that regular trains will commence running about November 1, from Harrisburg, in Saline County, Ill., to the Wabash, a distance of 80 miles, and that 100 miles of track is now laid. This is an increase of 15 miles since our last account.

St. Louis, Jerseyville & Springfield.

At a recent meeting of the board of directors of this company, at Jerseyville, Ill., the Chief Engineer, Mr. Moulton, reported that the line had been surveyed from Springfield, Ill., to Grafton, and that the cost of grading and tieing the road was estimated at $457,000, or about $6,000 per mile. It is expected that the building of the road will develop a large coal traffic along the line.

Iowa Pacific.

The grading is all finished beyond Waverley, in Bremer County, Iowa, and work is being rapidly pushed forward.

St. Paul & Iowa Southwestern.

The sum of $150,000 required by this company has nearly all been raised along the line of the proposed road. Dexter, Iowa, subscribed over $10,000.

Northern Pacific.

Messrs. L. H. Kaufman, A. C. Sands, T. Underwood and W. L. Bridgeman, the Commissioners appointed to inspect the track of the Northern Pacific Railroad, reached St. Paul, Minn., October 23, on their return. They went over the road to Silver Springs, Dakota, near the end of the track. They have made no formal report as yet.

The party, consisting of Gen. G. W. Cass, President, S. Wilkeson, Secretary, and C. B. Wright, F. Billings and W. B. Ogden, directors of the company, who have been visiting the Pacific end of the line, reached St. Paul, Minn., from San Francisco, October 24, and left for Duluth, to proceed to the end of the track in Dakota.

Northern Pacific—Pacific Division.

The track is now laid to a point 46 miles from Kalama, Washington Territory.

Wabash & Lake Michigan.

This company filed its articles of incorporation with the Secretary of State at Indianapolis, October 26. The company proposes to build a railroad from West Lebanon, on the Toledo, Wabash & Western road 29 miles west of Lafayette, Ind., northeast through Warren, Benton and White counties to Reynolds, on the Louisville, New Albany & Chicago road, 67 miles south of Michigan City. The length of the road will be about 45 miles and the capital stock is fixed at $500,000. William H. Irwin, Charles T. Mayo, George A. Shaffer, John L. Miller, John A. Williamson, Alonzo Cowgill and Richard Burbridge are directors for the first year.

Monroe & Dubuque.

The contract for the construction of the road from Shullsburg, Wis., to Monroe, about 35 miles, has not yet been closed, though negotiations are pending.

Peoria, Pekin & Jacksonville.

It is loosely reported that this road has been sold to the Chicago & Alton Company. The road extends from Jacksonville, Ill., north to Peoria, about 83 miles.

Galena & Southern Wisconsin.

The final survey and location of the second ten miles of the road, from Junction House to Platteville, Wis., is now being made, and work on the grading is to be commenced at once. The town of Platteville has voted $32,000 in aid of the road.

Central Railway Construction Company.

This company has been organized at Cedar Raipds, Iowa, by some of the heavy capitalists of that place, prominent among, whom are William Green, George Douglass, W. W. Walker and others, all well-known railroad men. It is reported that it is their intention "to buy, control, operate and build all the road they can."

Texas & Pacific.

Work has been commenced on three divisions, from Dallas Tex., east, from Sherman, east, and from Longview, west. The company's office at Marshall, Tex., has been completed, and work on the shops at that place has been commenced.

Cordoba & Tucuman.

Engineering says: "The Argentine Government has decided to accept proposals made by Messrs. Telfener & Lumb for the construction of the Cordoba & Tucuman Railway, which will penetrate into the interior of the Argentine Confederation for a distance of 320 miles. Messrs. Telfener & Lumb undertake to complete the line in four years, and although their tender was higher than the tenders of Messrs. Wheelwright, Lezica, and other competitors, it was preferred on this ground. The total sum to be paid by the Argentine Government for the construction of the line is stated at £1,515,974, while the sum provided by the recent Argentine Public Works Loan was £2,700,000." The cost of this line will thus be about $92,700 per mile.

Marietta & Pittsburgh.

A correspondent writes: "This road is now complete to Cambridge, O., on the Central Ohio Division of the Baltimore & Ohio road, 58 miles north of Marietta. This opens up a short route from Parkersburg, and Marietta to Pittsburgh *via* Cambridge and Bellair. By this route 103 miles is saved from Marietta to Pittsburgh and 91 miles from Parkersburg. Iron is also being laid from the northern end southward. The tunnel between Cambridge and New Comerstown is being pushed forward, and the bridge across the Tuscarawas River at the latter place is under contract to be finished early next season. With the completion of this road from Marietta to Canal Dover three short routes will be opened from the Ohio River at Marietta and Parkersburg to Pittsburgh *via* Cambridge and Bellair, *via* the Pan Handle at New Comerstown, and *via* Bayard and Wellsville over the Cleveland & Pittsburgh road. The latter connection also opens a short line between the Ohio River and the lakes of the Northwest, while a northwest extension, now in course of construction from a point near Cambridge to Mansfield, O., will give an outlet to the rich coal and black-band iron ore fields of the Wills Creek and Tuscarawas Valleys."

Davenport & St. Paul.

The track-layers on this road commenced work again this week near Delaware, the crossing of the Iowa Division of the Illinois Central road, which point was reached several weeks ago. It is said that the agents of the company have succeeded in placing its bonds to the amount of $3,000,000 with some German capitalists and that the work will now be pushed forward vigorously.

Chicago & Northwestern.

The contractors on the tunnel near Sparta, Wis., on the Madison Extension, have been much delayed by water in the eastern shaft. A distance of 1,350 feet still remains to be cut between the eastern and western shafts.

Richmond & York River.

It is said that the stockholders have made arrangements to sell the road, and that the bondholders and creditors acquiesce in the proposed sale. The road from Richmond, Va., to West Point, on York River, is 38 miles long.

Illinois Central.

A dispatch from Dubuque, Ia., says that the City Council of that city has given the Illinois Central Company the right of way to the location of the proposed new depot, on condition that the company build a wagon bridge over the river, pledge themselves not to discriminate any longer in freight tariffs against Dubuque, and fill up and macadamize the streets crossed by the track. The company has not yet accepted.

Danville & Charleston.

It is reported that contracts have been let for the grading of this road and that work is to be commenced at once near Danville. The road will extend from Danville, Ill., southwest to Charleston, on the Indianapolis & St. Louis road, a distance of about 55 miles.

Boston Union Freight Railroad.

This railroad, constructed to facilitate transfers between the different railroads and the wharves, was opened for traffic on October 29.

San Diego & Los Angeles.

At a meeting held at Los Angeles, Cal., October 14, the following propositions were made by the Texas & Pacific Company with regard to the San Diego & Los Angeles road:

"Section First provides that the San Diego & Los Angeles Railroad Company secure the right of way, depot grounds, grade, bridge, etc., free of encumbrance.

"Section Second—The company is to give mortgage bonds of $20,000 per mile, at 7 per cent., gold, to be used for iron, laying track, building depots, shops for rolling stock, and other needful property, the mortgage to cover the road franchise and lands donated to aid in its construction.

"Section Third—The money expended for grading, right of way, bridging, ties, depots, etc., is to be represented by preferred shares on the capital stock entitled to 7 per cent. out of the net earnings.

"Section Fourth—In consideration of the foregoing, the Texas & Pacific Company agree to take the bonds, provide iron, depots, equipments and lay track, and shall be entitled in the common stock to an amount exceeding the preferred shares by five per cent., in order that the line be worked in perpetuity in harmony with the Texas & Pacific.

"Then follow equitable conditions, provided that the Texas & Pacific, on final examination of the coast range from San Diego, east, should construct their line out of San Diego on a location that would provide part of the road to Los Angeles."

Denver & Platte Valley.

In view of the very strong opposition developed, this company has withdrawn the request for $300,000 in bonds from Arapahoe County, Col., and will resort to other means of obtaining money.

Mobile & Alabama Grand Trunk.

The track is laid on this road to the Tombigbee River opposite Jackson, Ala. This point is 57 miles from Mobile and 24 miles beyond the point which the track-layers had reached at our last accounts. Work on the bridge over the Bigbee had not yet been commenced, but all the materials for the bridge were on hand and the bridge-builders will soon be at work.

Missouri, Kansas & Texas.

Trains have commenced running to Caddo, in the Indian Territory. Caddo is about 23 miles north of Red River and is about 42 miles south of Atoka, the last reported terminus.

Cayuga Lake.

The Utica (N. Y.) *Herald* says that passenger trains were to commence running on this road about November 1. The road extends from Cayuga, N. Y., on the Auburn Branch of the New York Central road, south to Ithaca, a distance of about 35 miles.

Rochester & Pine Creek.

The Engineer of this road has commenced the location of the road at the southern end, and the grading parties will soon be set at work. The road will extend from Caledonia, on the Attica Branch of the Erie Railway, southwest to Caledonia, on the Buffalo Division of the same road. It will be about 27 miles long, and some work has been done on the northern end.

Bangor & Calais Shore Line.

The town of Ellsworth, Me., has voted the sum of $65,000 in aid of this proposed road. Harrington has voted to take $12,000; Whitneyville, $5,563, and Marshfield, $2,000, in the stock of the company.

Columbus & Toledo.

Mr. Fisher, Chief Engineer of this company, has commenced the survey of a new line. The new line will cross the Olentangy Creek near its mouth and thence run nearly due south to Delaware. It will be to the east of the first line surveyed.

Mississippi & Muscatine.

This company filed amended articles of incorporation with the Secretary of State of Iowa, October 19. The amendment was made to enable the company to continue its line to Wapello, on the Burlington, Cedar Rapids & Minnesota road, or to the city of Burlington.

Pittsburgh, Wheeling & Kentucky.

The Wheeling (West Va.) *Intelligencer* reports that the grading of five sections of the road near that city is finished.

Lehigh & Susquehanna.

It having been asserted that the lease of this road by the New Jersey Central Company had never been filed in the office of the Secretary of State of New Jersey, and therefore was affected by the recent decision of the Vice-Chancellor of that State, in the suit between the New Jersey Central and the Delaware, Lackawanna & Western companies, the Allentown (Pa.) *News* says:

"We are reminded that the New Jersey law of 1871, relative to the recording of leases and agreements between railroad

companies, only relates to a lease *by* a New Jersey corporation, and it was passed after the lease of the Lehigh & Susquehanna Railroad to the Central of New Jersey. Therefore, on both grounds, it is inapplicable to that lease. The contract between the Delaware, Lackawanna & Western and the Central was entered into during the present year, and of course is subject to "the law requiring it to be filed."

New Orleans, Mobile & Texas.

The New Orleans *Picayune* says: "Senator William Sprague, of Rhode Island, and party arrived in our city in a special train from Mobile. Mr. Sprague stated that the board of directors of the New Orleans, Mobile & Texas Railroad had tendered him the presidency of the company, and his present visit to Louisiana was one of examination and survey of the property to see if he would accept."

Grand Trunk.

The Buffalo *Commercial Advertiser*, of October 26, says of the change of the gauge of the line from Buffalo to Port Huron:

"At the present time preparations for the change are being pushed with the utmost vigor. The necessary alterations in the bridges, culverts, sidings, warehouses and engine-sheds are all complete and ready for the alterations which it is fully expected will take place in the middle of next month. New narrow-gauge engines, Pullman cars and day passenger cars, and a large number of cars for freight, both box and platform, have been constructed, and are now in readiness for the enormous traffic already partly interchanged between the New York Central and Michigan Central railroads by means of their connections through Canada.

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"The Company will no doubt be largely benefited, not only by the fact of their increased traffic, but by the better dispatch they will be enabled to give to their freight from this city going West, and *vice versa*; and, also, by the great relief their rolling stock will at once experience from the fact of the cars of almost all other companies being able to run through direct, instead of their contents having to be transferred into broad-gauge cars, the sole property of the Grand Trunk Company."

Delhi & Middletown.

The first twelve miles of this New York road are about completed, on which it is proposed to lay the track this season. The balance of the thirty miles of road it is reported will undoubtedly be completed next year by the contractors, Messrs. Boice & Co, who are energetically urging forward the work of construction.

New Bedford & Taunton.

The Boston *Advertiser*, of October 25, says: "The proposition of the Boston & Providence Railroad corporation for a union with the New Bedford & Taunton was received some days ago, and it is understood that five of the seven directors of the latter road, including the President, are in favor of closing with the Boston, Clinton & Fitchburg, which proposes to lease this road for fifty years.

Logansport, Crawfordsville & Southwestern.

The Treasurer announces that the coupons due November 1 of the first-mortgage bonds of this company will be paid on and after that date at the office of the Financial Agents, Jones & Schuyler, No. 12 Pine street, New York.

Dividends.

The Boston & Albany pays the usual half-yearly dividend November 15.

The St. Louis, Kansas City & Northern announces a dividend of 2 per cent. on the preferred stock, payable by Morris K. Jesup & Co., No. 59 Liberty street, New York, November 15. The transfer books were closed November 1 and will be reopened on the 15th. This is the first dividend paid by this company.

Connecticut Air Line.

It is reported that the contract for completing this railroad has been awarded and signed, the work to be begun at once and finished by the 1st of December.

New York Central & Hudson River.

Wall street reports are to the effect that this company contemplates a new issue of $35,000,000 of bonds, $15,000,000 to be applied to the retirement of an existing bonded debt and the rest to the construction of two new tracks especially for the accommodation of freight trains. The idea of the two new tracks seems to strike Wall street as a new one. As we have noted before, the construction of these was not only determined upon months ago, but actually begun. It is a work which attracts comparatively little attention, because it consists chiefly in a simple extension of side tracks—which the growth of traffic renders necessary without reference to the construction of new through tracks. In course of time the sidings between two stations meet, as they have already done at several points on the Central, and then there are four parallel tracks between those stations. The work is first done, of course, where the traffic crowds the line most, and not continuously from either terminus.

Vanderbilt Underground Railroad.

The contract for making the necessary changes in the sewer, gas and water pipes and house connections on the line of this road from Fifty-sixth street to the City Hall, has been let to Fairchild & Ward.

New York & Harlem.

The contract for the "Fourth avenue improvement," on the section between Seventy-ninth street and Harlem River, New York, has been let to Dillon, Clyde & Co., a firm of which Sidney Dillon, who has constructed probably as much railroad as any other living man, is the head. The section between Fifty-seventh street and Seventy-ninth the engineers are now at work on, and that between Fifty-seventh and Forty-ninth is nearly ready for proposals. Work is progressing on the section between Forty-ninth and Forty-second.

San Francisco & Colorado River.

This company recently withdrew its application for a gift of ten millions from San Francisco, which the Board of Supervisors voted to submit to a vote of the people, and the Supervisors accordingly passed a resolution providing for the election. But now the City Attorney, sustained by leading lawyers, holds that the Supervisors cannot withdraw the proposition, and that the election on this question must be held. The election was appointed for the 5th. There is no probability of any considerable number of votes in its favor.

Rutland.

A meeting of the stockholders of this company was held in Rutland, Vt., October 21. The President, Governor Page, stated, in brief, the action of the last meeting authorizing the issue of preferred stock, the failure to obtain subscriptions to the full amount in the time limited, the procuring of the amendment of the charter, the object of the present meeting, etc. He stated that when it was found impossible to obtain the necessary subscriptions to the preferred stock, the floating indebtedness was taken care of by several of the directors and stockholders loaning the money to the corporation and taking their notes therefor. Since the last meeting considerable of the floating indebtedness had been paid by the income of the road.

A resolution was adopted by a unanimous vote accepting an amendment, passed by the Vermont Legislature and approved by the Governor October 17, to the act of incorporation of the Rutland Railroad Company. This amendment simply empowers the stockholders to authorize the directors to issue bonds, notes, etc., secured by mortgage on the property of the corporation, bearing interest at a rate not exceeding 8 per cent., and making such mortgage a valid lien on the personal property (cars, locomotives, etc.) of the corporation without a change of possession.

A resolution was also unanimously adopted declaring it expedient to issue "obligations, bonds, or promissory notes, in sums of one hundred dollars, five hundred dollars and one thousand dollars each, to an amount not exceeding fifteen hundred thousand dollars, to bear date the 1st day of November, 1872, and be payable in thirty years from that date, with interest at the rate of eight per cent. per annum, payable semi-annually, with coupons or interest warrants thereto attached, for the purpose of raising means to pay the indebtedness of this company, and to secure the payment thereof, according to their tenor, by the execution of a mortgage for and in behalf of the company of its franchise, railroad and property, exclusive of such rolling stock as is already mortgaged for the payment of $500,000 seven per cent. and $500,000 eight per cent. equipment bonds, and subject to the lease or contract, to the managers of the Vermont Central and Vermont & Canada railroads, and as they may be advised, shall be valid and binding. The principal and interest to be payable in the city of Boston."

It was voted that this mortgage be made in trust to Jacob H. Lord and Jacob Edwards; that the obligations authorized shall be sold only to retire an equal amount of the company's indebtedness now outstanding; and that the coupon bonds thus authorized may be exchanged for registered bonds in sums of $1,000 each. A report of the meeting says:

"Governor Page, in reply to questions, stated that this mortgage would pay the floating debt of the company. No contract was made with the Addison Railroad Company for grading, etc., by this corporation; that contract was made by the Addison Railroad Company directly with the managers of the Vermont Central. The Rutland Railroad has received its rent promptly on its lease to the Central, it being paid, as stated in the published report, from the Cheshire and Connecticut River railroads. We settle with the Central once in six months, and they pay whatever balance may be found due over and above the receipts aforesaid. I can say that the Central owes us nothing; that they have paid their notes given for wood, shop stock, etc., and owe no rent until November 1, which is secured as aforesaid. The rolling stock, etc., has been kept up by the managers of the Central. They have done as well, if not better, than we should have done had we retained possession."

The President also read a subscription paper agreeing to take these bonds at par, to the amount of $710,000, provided that the sum of one million dollars be subscribed for before January 1, 1873, the subscribers and amounts being as follows:

George B. Chase	$150,000 00
A. W. Spencer	100,000 00
Jacob Edwards	100,000 00
James S. Whitney	50,000 00
Skillings, Whitney Brothers & Barrows	50,000 00
George M. Barnard	100,000 00
John Curtis	25,000 00
J. J. Dixwell	10,000 00
Charles H. Warren	10,000 00
George H. Peters	20,000 00
Washington Insurance Company	25,000 00
John B. Page	50,000 00
W. J. Sobier	20,000 00

The President said that the prompt negotiation of these bonds would enable the company to resume payment of dividends, on preferred stock, in cash, February 1, and he thought he could assure them that by August 1 such dividends would be paid in cash and the scrip retired.

A draft of the proposed new mortgage was then read and approved. On motion of George M. Barnard, of Boston, a resolution was passed that as fast as the indebtedness of the company is reduced and the preferred stock held as collateral (and issued for that purpose) released, such stock shall be cancelled until no more than $4,300,000 is outstanding, that amount to be the limit of the preferred stock hereafter.

The mortgage authorized at this meeting has been duly executed and recorded in many, by this time probably in all, of the counties through which the road runs.

Virginia & Truckee.

The timbering of the tunnel near American Flat, on this road, took fire October 17 and, nearly all the timbering having been destroyed, the tunnel caved in. The fire, it is thought, originated from a spark from a locomotive. Travel on the road was delayed about ten days.

Owing to the uncertainty as to the time required to repair the tunnel, a side track has been laid around the east side of the hill, over which the cars will be drawn by horses. Some delay has been occasioned in the work at the tunnel by a difficulty in getting laborers.

National Railway.

The Trenton (N. J.) *State Gazette* says that work on this road has been stopped for the present, but that the suspension is only temporary.

Bound Brook & Perth Amboy.

This road is to pass through Metuchen, instead of taking the northerly route through Uniontown, the farmers along the line having reduced the sums asked by them for the right of way.

Cleveland, Columbus, Cincinnati & Indianapolis.

This company has contracted for 30 new locomotives, to cost $360,000.

Toronto & Nipissing.

The rails have been laid to Coboconk, Can., the northern terminus, and the road will be opened for travel in about a week. Coboconk is 87 miles from Toronto and 22 miles from Midland Junction, the late terminus.

Detroit & Bay City.

Track has been laid to Lapeer, 16 miles beyond Oxford, the late terminus, and trains will run from Detroit to Lapeer as soon as the road can be ballasted. The track is now being laid between Lapeer and Bay City.

Pennsylvania—New York Division.

The new shops west of the Hackensack River are making rapid progress, and the walls of several of the buildings are nearly finished. The foundations of all the buildings are laid, nearly 7,000 piles having been driven into the ground. The largest of the buildings is the round-house, which will be 480 feet in diameter, and will hold over 50 engines. There will be a car shop 240 by 100 feet, a paint shop 410 by 100 feet, a blacksmith shop 160 by 120 feet, an erecting shop 140 by 70 feet, a machine shop the same size, and a boiler shop. All of these buildings will be one story in height. The ground upon which these shops are built is a portion of what is known as the Hackensack Meadows, and was diked and partially drained by Mr. S. N. Pike, several years ago. The company has purchased the triangular tract lying between their own and the Morris & Essex roads and the Hackensack River, comprising 288 acres, at a reported cost of $166,000. The expense of completing the drainage and putting in piles for the foundation of the buildings has been very large, but no other large tract of land suitable for the company's purposes could have been obtained anywhere near the terminus of the road at any reasonable price.

The new time-table, which took effect October 27, shows a total of 43 regular passenger trains leaving Jersey City each day, with an equal number arriving. There are 17 through trains, of which four are Western express trains, three Washington express, nine Philadelphia trains and one an emigrant train. The remaining 26 are local passenger trains. By an order recently issued all trains are run by Philadelphia time.

Washington, Cincinnati & St. Louis.

Harrisburg, Va., has voted to subscribe $25,000 to the stock of this proposed narrow-gauge road.

Charlotte, Columbus & Augusta.

At the recent annual meeting of this company, at Columbia, S. C., October 22, a resolution was passed authorizing the President and directors to issue $1,000,000 of 7 per cent. bonds to be secured by a mortgage upon the road. The bonds are to be of $1,000 each, and are to be issued for the purpose of paying the floating debt and more fully equipping the road. It was also resolved that repair shops be erected in Augusta, Ga., provided that the suit commenced by that city against the company be discontinued. The question of building a road from Lotz to Ninety-six was referred to the board of directors.

Boston & Maine.

Construction trains on the Portland extension have reached Blue Point, working west from Portland.

Kennebec & Wiscasset.

The town of Hartland, Me., has voted to take $10,000 stock in this company.

West Wisconsin.

The machine shops are to be removed to Hudson, November 1.

Springfield & Northwestern.

The difficulties between the opposing boards of directors having been arranged and a new board formed whose authority is unquestioned, work is to be pushed forward. The road from Petersburg, Ill., to Springfield has been finally located on the north side of the Sangamon River and through the town of Athens. The grading is finished to Antioch Church, within 10 miles of Springfield, and will be finished to that city this year. Work on the bridge at Springfield will be commenced at once.

A telegram from Springfield, Ill., dated October 26, reports that this railroad has been sold to the Indianapolis, Bloomington & Western Company. A section of the road, 30 miles long, from Havana, Ill., to Petersburg is completed, while the section from Petersburg to Springfield is under construction. It is intended eventually to extend northwest to Rock Island. It does not readily appear how the road can be conveniently worked in connection with the Indianapolis, Bloomington & Western.

Elevator at Indianapolis.

A company has been organized to build an elevator with a capacity of 300,000 bushels, at Indianapolis, Ind., and filed its certificate of incorporation, October 24, with Edward King, Nicholas McCarty, Wm. P. Gallup, Ingram Fletcher, George Merritt, Wm. Coughlen, Thomas D. Kingan, Charles Mayer, Jas. C. Ferguson, John C. Wright, David Macy, S. A. Fletcher, Jr., D. H. Oliver, C. W. Smith and John E. Simpson, stockholders. C. W. Smith, Wm. Coughlen, Ingram Fletcher and Nicholas McCarty are the chosen directors for the first year. The capital stock is $100,000, and the building will be located between the track of the Indianapolis & St. Louis and the Indianapolis, Bloomington & Western railroads.

Delaware, Lackawana & Western.

This company is now replacing their iron rails with steel, as fast as the iron wears out. About one-half of the Morris & Essex Division is now laid with steel, and in about two years the whole road will have been relaid.

The method of relaying the track is as follows: Thirty or forty rails are secured to each other by fish plates. When ready to be put in position, the old rails are removed from their bed by simply withdrawing the inside spikes. The section of new rails is then taken up by a gang of laborers and slipped under the outside spikes, which have not been moved, and the inner spikes are then replaced. The track is therefore obstructed not more than half an hour at a time, a very important advantage where so many trains are continually passing.

Warren & Venango.

The ties are now laid to Titusville, and it is expected that the iron will be down in about three weeks.

Syracuse Northern.

The Utica (N. Y.) *Herald* of October 23 says: "The directors of the Syracuse Northern Railroad have taken the preliminary steps toward effecting a junction of that road with the Central and Chenango Valley roads in Syracuse. The proposed extension of the Northern road to the lakes and to Watertown is still undetermined, but there appears to be a fair prospect of carrying the project through in the course of the ensuing year."

Milwaukee Northern.

Trains are running to Chilton and the track is laid to Sherwood, six miles beyond the Menasha junction. The work is being pushed forward and it is hoped that the track will be laid to Menasha by November 10.

Muscatine Western.

Tracklaying has been stopped on account of the difficulty in obtaining iron. Thirty miles of the road are completed and the grading is finished for 15 miles further.

Montpelier & Wells River.

Work is to be resumed on this road and 200 tons of rails will be delivered in Montpelier, Vt., this week.

Nashville & Chattanooga.

An exchange paper reports that this road is now, for the first time in its history, carrying more freight north than south, and that wheat is being shipped from Middle Tennessee and coal from the Sewance mines to St. Louis. Probably we should read towards for to.

Buffalo & Jamestown.

The first rail was laid October 21, and track-laying is going forward. It is expected that trains will run to White's Corners, 12 miles from Buffalo, by November 15. At White's Corners the erection of the iron bridge over the North Branch of Eighteen-Mile Creek will delay the track layers somewhat. The grading is finished to North Collins, about 20 miles. Two locomotives have been ordered from the Brooks Locomotive Works at Dunkirk, ten flat cars have been received, and more are being built at the Buffalo Car Works.

A proposition has been made to the Oil Producers' Railroad Company of Pennsylvania, looking to the construction and operation of the two roads under one management.

Vicksburg & Nashville.

The road-bed is graded from Okolona, Miss., on the Mobile & Ohio, west to Houston, in Chickasaw County, a distance of about 20 miles. The iron is expected soon, and will be put down as fast as it arrives.

Savannah & Charleston.

The Savannah (Ga.) *News* says:

"It is reported that the Savannah & Charleston Railroad Company have purchased the large tract of land in the western part of the city, between the old Hebrew burying-ground and

the Laurel Grove Cemetery, for the purpose of erecting freight and passenger depots and other buildings necessary for its business. The construction of the Port Royal Railroad, which is progressing rapidly, is daily increasing the receipts of the Savannah & Charleston Railroad."

Baltimore & Potomac.

The contractor for paving First street, in Washington, attempted to obstruct the track of the Washington & Alexandria Railroad (now owned by the Baltimore & Potomac Company) through that street by dumping sand upon the track, he claiming that his contract obliged him to pave the whole width of the street, including the portion occupied by the tracks. After a stock car had been thrown from the track and several trains delayed the matter was adjusted, and the contractor left the tracks unmolested.

Intercolonial.

This railroad, having been completed from its late terminus at Amherst, N. S., to a junction with the Nova Scotia Railway at Truro, has been opened for travel. This completes a railroad line from Halifax to St. John, N. B., trains running over the Nova Scotia Railway from Halifax to Truro, the Intercolonial from Truro to Painsec Junction, and the European & North American from Painsec Junction to St. John.

Houston & Central Texas.

The Railroad Committee of San Antonio, Tex., having addressed this company with respect to the extension of their road to San Antonio, the company replied that their charter gave them no authority to build such extension, and nothing could be done in the matter at present.

Portage & Grand Rapids.

The Portage (Wis.) *Register* says that orders have been given to commence work on the road from that place to Grand Rapids at once.

Richland Center & Elroy.

The survey for a line of railroad from Richland Center, Wis., to Elroy has been completed. The highest grades found will not exceed 80 feet to the mile.

Tomah & Wauzeka.

A narrow-gauge railroad is talked of, to run from Wauzeka, Wis., 18 miles east of Prairie du Chien, north to Tomah, about 80 miles.

Decatur, Sullivan & Mattoon.

Work on this road is progressing well, and it is expected that the road will be completed by the end of November.

Paris & Decatur.

It is expected that iron will be laid from Paris to the junction with the Decatur, Sullivan & Mattoon, at Mount Zion, by November 10.

Green Bay & Lake Pepin.

Track is laid three miles west of Amherst, Wis., and the grading is well advanced towards Grand Rapids. The company has finished the dock at Fort Howard, and the rails will be laid upon it at once. The dock has 490 feet front on the river, and is 110 feet wide.

Helena & Iron Mountain.

Some $600,000 in money and about 150,000 acres of land having been subscribed to aid in the construction of this Arkansas railroad, Mr. Thomas Allen, President of the St. Louis & Iron Mountain Company, has offered to take hold of the road and complete it, provided the franchises and assets of the company be turned over to him, free of all incumbrances. He will also call for assistance from the people along the line.

Arkansas Central.

This company is building repair shops at Helena, Ark. Regular trains to Clarendon will be put on as soon as some additional rolling stock is received.

St. Paul & Chicago.

Track-laying from Winona to La Crescent will soon begin at Winona. The contract for the depot buildings at Winona, La Moille and Dakota has been let to G. W. Sherwood, of St. Paul.

Winona & St. Peter.

Track is now laid 10 miles beyond the new town of Marshall, and 85 miles beyond New Ulm, Minn. The road is to be completed to the Big Sioux River by November 30.

Toledo, Muncie & Southwestern.

This company, which filed its articles of incorporation with the Secretary of State of Indiana, October 23, proposes to build a railroad from Muncie, Ind., northeast through Delaware, Jay and Adams counties, passing through the towns of Albany and Camden, to a point on the State line near the town of Willshire in Van Wert County, Ohio. The length of the road will be about 50 miles and the capital stock $500,000. The directors for the first year are: Jesse S. Norton, Thomas M. Cook, Thos. S. Merrill, Reuben B. Mitchell, D. N. H. Howard, Thomas Kirby, H. J. Lockhart, William G. Sutton and P. V. Collins.

Denver, Georgetown & Utah.

This company has asked Arapahoe County, Colorado, the county in which Denver is situated, for $200,000 in bonds. The election to decide the question is ordered for November 11.

Dakota Southern.

The company has received a baggage car, passenger coach and two additional locomotives, and trains will be put on the road between Sioux City, Iowa, and Elk Point at once.

Philadelphia & Reading.

The Adams Express Company has applied to the United States Circuit Court in Philadelphia for an injunction to restrain the Philadelphia & Reading Company from monopolizing the express business over their road, and also to restrain the company from delivering or collecting express packages beyond the termini of their railroad. The railroad company claims that their charter gives them full power to carry on an express business in connection with their road, and also that they have not refused to carry the plaintiff's goods except when offered at the baggage car. The company also claim that they had the right to terminate the contract with the Express Company. The case is not yet decided.

Lake Ontario Shore.

The town of Webster, N. Y., has commenced a suit to restrain the issue of $75,000 in bonds of that town to the Lake Ontario Shore Railroad Company, on the ground that the issue of bonds was obtained by false representations. A temporary injunction has been granted.

Pennsylvania Petroleum.

Work is progressing rapidly between Titusville and Enterprise. The Pithole Division, to Pleasantville, is nearly all graded. From Titusville to Cambridge, on the Atlantic & Great Western road, the grading is nearly finished, and several miles of track is laid out of Cambridge.

New York Central & Hudson River.

The railroad shops in Syracuse are to be removed to a location two miles and a half east of the city, in the town of Dewitt. A branch line is also to be built around the city of Syracuse, on the north side, about nine miles long, between Geddes and Dewitt, for the exclusive use of through freight trains, in order to relieve the city from the interruptions to travel and business now experienced from those trains.

Western Maryland.

Several lines have been surveyed for the extension west from Hagerstown, but nothing has been yet decided as to the route of the extension.

Cleveland, Mount Vernon & Delaware.

Regular trains were to run to Mount Vernon, November 1, and by January it is said trains will run from Columbus to Cleveland, by way of Akron.

Ashtabula, Youngstown & Pittsburgh.

This company is building a round-house at Ashtabula, and is preparing to construct its docks in the harbor at that place.

Cuyahoga Valley.

The Toledo (O.) *Commercial*, of recent date, says:

"The Cuyahoga Valley Railroad, in process of construction from Cleveland to a point on the proposed line of the Wheeling & Lake Erie Railroad, about fifty miles from the eastern terminus, is seeking to perfect such arrangements as will give it access to Wheeling. It is thought that a proposition will be made by which the Cuyahoga Valley Company will agree to pay half the expenses of the construction of that portion of the Wheeling & Lake Erie road between Wheeling and the point of the junction, and will also take a liberal amount of stock in the proposed railroad bridge across the Ohio River.

Chesapeake & Ohio.

The Richmond (Va.) *Whig*, of October 21, says of the progress of this road:

"At Graham's Ferry the splendid iron bridge over the Greenbrier is almost completed. Two spans are up, and but for an error, made by the engineers, as to the length of the third span, it would also have been finished. The mistake was not discovered until the workmen had raised it to its place, when it was found necessary to return it to the foundry and have another cast. Days ago the track was pushed through Great Bend tunnel, one mile and a quarter, which is the longest completed tunnel in America. The timbering up is nearly finished, and the greater portion of Captain Johnson's force has been dispatched to Miller's Ferry, in charge of Captain Steele. The cars run slowly through the tunnel, as rock is constantly falling from the unfinished portion, and a few days ago the timbers fell in with such force as to destroy the rails. At the mouth of Lick Creek a little town called New Richmond is springing up, but the iron horse has passed them by and is rapidly pushing on to Stretcher's Neck Tunnel. From thence to Kanawha Falls the work will not go forward so fast, as the rock cuttings are hard and heavy. It will be the first of February before the work near Miller's Ferry and Hawk's Nest is completed and the first through train passes over the line from Richmond to Huntington."

North Louisiana & Texas.

In the case of the State of Louisiana against the North Louisiana & Texas Railroad Company, the District Court of the Fourteenth District of Louisiana has given the following decision:

"By reason of the law and the evidence in this case being in favor of the plaintiff and against the defendant, it is ordered, adjudged and decreed that the State of Louisiana, plaintiff, do have and recover of the North Louisiana & Texas Railroad Company, defendant, the corporation created by act No. 108 of the General Assembly of the State of Louisiana, approved September 26, 1868, the sum of eighty-seven thousand three hundred and sixty dollars ($87,360), with 8 per cent. interest per annum on the sum of $21,840 thereof from the 1st of October, 1870, till paid; 8 per cent. interest on the sum of $21,840 thereof from the 1st day of April, 1871, till paid, and 8 per cent. interest on the sum of $21,840 thereof, from the 1st day of October, 1871, till paid. And 8 per cent. interest on the sum of $21,840 thereof, from the — of April, 1872, till paid.

"It is further ordered, adjudged and decreed that the mortgages created by sections 11 and 12 of the above recited act of the General Assembly of the State of Louisiana, No. 108 of acts of session of 1868, in favor of the State of Louisiana, on the said North Lousiana & Texas Railroad, its fixtures and appurtenances, be recognized and enforced; and that said railroad, its fixtures and appurtenances, be seized and sold according to law, to satisfy plaintiff's demands as herein set forth.

"It is further ordered, adjudged and decreed that there be judgment as in case of non suit, on that portion of plaintiff's demand which asks that the three hundred bonds, which are alleged in plaintiff's petition to have been illegally issued, of the first day of October, 1869, be decreed null and void.

"It is further ordered, adjudged and decreed that defendant pay all costs of this suit."

International.

Texas papers report that Col. Williams, of San Antonio, having visited Hearne with propositions from Bexar, Hays, Travis and Carrol counties to give $800,000 in county bonds to this company, provided work on the western line should be begun at once, the proposition was telegraphed to New York, and an answer returned from the President of the company that work would be commenced as soon as the company received the bonds due from the State.

It is said that the company has brought suit against Comptroller Bledsoe, of Texas, for damages sustained by his refusal to sign the bonds of the State to be issued to the company, after the Governor and Treasurer had signed them. The amount of damages claimed is $750,000.

Flint & Pere Marquette.

The Detroit *Tribune*, of October 26, says: "The competition occasioned by the opening of the Detroit & Bay City Railroad will shorten the running time between these two places by about two hours. The fastest train on the Flint & Pere Marquette road now makes the distance in 4:40, and the other in 4:50. Next spring the company propose to run the trains through, one in 2:45 and the other in 3 hours, making a running time of 40 miles per hour. In order to make this time, new rails are to be laid on the Detroit & Milwaukee road from Holly, and the track well ballasted."

Lynchburg & Danville.

The Baltimore *Gazette* says:

"At a meeting of the stockholders of the Lynchburg & Danville Railroad, held in Lynchburg on the 15th inst., the proposition of consolidation made by the directors of the Orange, Alexandria & Manassas Railroad Company was accepted, and the contract signed by the representatives of both roads. The basis of consolidation is that the shares of the consolidated company shall be of the par value of $50 each, the stockholders of the Orange & Alexandria Company receiving share for share, and in the other receiving two shares for each share so held, the present par value of the Lynchburg & Danville shares being $100.

"The Chief Engineer of the Lynchburg & Danville road reported the work on the road progressing rapidly; that the work upon the first division, extending from Lynchburg south a distance of 33 miles, will be finished during next month, with the exception of the tunnel in Lynchburg and the masonry of Taunton River bridge. The former, under favorable circumstances, can be completed before the close of winter. The second division will be finished by the end of the year.

"This extension of the Orange & Alexandria Railroad will unite at Danville with the road to Greensboro, North Carolina, although of a different gauge, which ramifies through all the Southern States. It is contemplated in the same interest to build a road to Statesville that will give even better advantages to the increased trade of Baltimore. The latter link of the one gauge in the system of roads will give from Baltimore an additional continuous line of rail piercing the very centers of the Carolinas, traversing through Georgia and to the coast, all feeders of the main line that has its nearest eastern terminal at this city."

Louisville, Harrod's Creek & Westport.

This company is constructing a narrow-gauge railroad from Louisville up the south bank of the Ohio River. Contracts have been let for the construction of ten miles from Louisville, which is now graded, and five miles are laid with 25lb. iron, and the company is about making a contract for 35lb. iron for the other five miles. The distance to Westport is 25 miles, and it is intended to complete the road to this point, and eventually further toward Cincinnati. James Callahan, of Louisville, is President.

Gallipolis, McArthur & Columbus.

This company has published a pamphlet containing a report on the mineral resources on the line of its proposed road, which is to extend from the Ohio River at Gallipolis a little west of north through Vinton and McArthur to a junction with the Columbus & Hocking Valley road at Logan, a distance of about 60 miles. For most of the distance the route is in the valley of Raccoon Creek, past extensive beds of iron ore of the "Hanging Rock" district, and it is entirely within the coal measures of Eastern Ohio. There are 65 blast furnaces in this "Hanging Rock" district (not all now in blast) and several directly on the line of the road, most of which now use charcoal; and there are several coal beds worked near the line. The engineer reporting estimates that the cost of making pig iron with coal on this line will not be more than $19 per ton, as coal, ore, limestone and fire clay are almost everywhere in close proximity, and there need be scarcely any expenditure for transportation before the smelting of the ore. The report is accompanied with several maps showing sections of formations along the line and the route and connections of the road. A little above McArthur the proposed Farmers' & Miners' Railroad would give it a short outlet to Urbana, and a short line from Galipolis southeastward in West Varginia would connect it with the Chesapeake & Ohio. The Marietta & Cincinnati is crossed at Dundas. The mineral resources of the country are what is depended upon to give traffic to the road, however; and if they, or their value is not exaggerated, they will be amply sufficient. It is said that the workable veins of coal, within six miles of the line of the road, already tested and above the water line, can supply a greater amount of fuel than all the mines of Belgium, which sustain the most extensive iron works on the continent of Europe.

Trenton Bridge.

A large number of Detroit merchants and vessel owners have petitioned the Board of Supervisors of Wayne County, Mich., to rescind the resolution by which it recently authorized the Detroit River Railroad & Bridge Company to construct a bridge (for the use of the Canada Southern & Chicago Railroad) from Trenton over the western channel of Detroit River to Grosse Isle, and from Grosse Isle to Stoney Island. They claim that the company also intends to bridge the eastern channel, to the great detriment of navigation.

The Buffalo Board of Trade passed a similar resolution, but afterwards added a supplementary one affirming that the bridging of the channels west of Stony Island is objectionable only as a part of a system for bridging the main channel between Stony Island and the Canada shore. The Board also delivered itself of the following general utterance on the subject of bridges on navigable channels:

"*Resolved*, That the action of this Board has always been in favor of free trade and free commerce between the States, and in favor of all facilities for our inland commerce,- such as bridges and tunnels when required by railroads, and free canals to secure cheap transportation; and that the first duty of parties interested is to examine and find whether a tunnel is practicable, and when it is practicable the river should be tunnelled as mountains are; and when not practicable, bridges should be permitted and only justifiable on the ground of great public necessity to facilitate our inland commerce. Upon no other ground do we believe that our great natural channel ways for inland commerce—now greater than our foreign commerce—and its sources should ever be bridged."

Rutland.

At a meeting of the stockholders of the Rutland Railroad Company, held at Rutland, Vt., October 21, the issue of a million and a half dollars of bonds secured by mortgage, to pay the floating debt of the corporation, was authorized by a unanimous vote. It was also voted that the preferred stock never should exceed the present amount, $4,300,000.

Ware River.

The town of Ware, Mass., has authorized its town treasurer to receive second mortgage bonds of the Ware River Railroad for coupons due now or on the 1st of December, at the rate of 60 cents on the dollar, and to exchange $10,500 of first mortgage bonds for $12,000 of the second mortgage, provided the track of the road is completed from Gilbertville to Winchendon.

Fitchburg Union Depot.

When this subject was before the Massachusetts Legislature in 1869, it was provided that if the companies interested should fail to agree within three years, three commissioners should be appointed by the Supreme Court, with power to go on and construct a depot as they shall see fit and assess the cost upon the railroad companies interested. The directors of the Boston, Clinton & Fitchburg Company have now petitioned the Court for the appointment of these commissioners, and there is now a reasonable prospect that the depot will be built at no distant day.

Boston & Albany.

Petitions are being circulated along the line of this railroad, asking that the running of Sunday freight trains may be abated, and special attention has been called to the fact in Springfield. It is claimed that the religious services in many of the towns on the road are seriously interfered with by the noise of the trains.

Lee & New Haven.

The Springfield *Republican* says: "The whole of the Lee & New Haven Railroad has now been sublet. Kelly & Rogers, of West Stockbridge, have the first five miles, and C. C. Churchill, of Hastings, N. Y., the remaining 20 miles. The road is now being located."

Central Vermont.

The Springfield *Republican* says: "The bill introduced into the Vermont Legislature and referred to a committee, to reincorporate the Vermont Central and Vermont & Canada railroads under the title of the Central Vermont, is one of the loosest pieces of statute-making ever laid before a Legislature. It is the bill of Governor Smith's party, and seeks to create a corporation with absolutely no limitations as to the amount of its capital, and with unlimited authority to issue preferred stock and bonds. Unless we much mistake the temper and quality of the legislators of Vermont, not only this bill but all the affairs of the road will receive a healthy overhauling."